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NEW COMPUTER EXPRESS

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ST
- Sim City at last!
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PC
- Handwriting reader
- Smart security
- Railroad Tycoon

CONSOLES
- Wraps off Mega Drive
- On-line round-up

ARCHIMEDES
- Herewith the Clues

Specialist Columns for:
BBC•C64•MSX•PCW•QL
CPC•SAM•SPECTRUM

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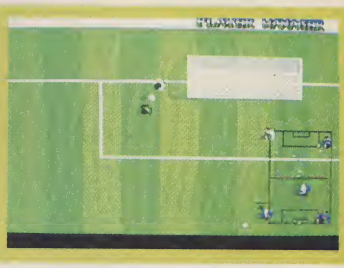

SONY CD-I STUNNER

EXCLUSIVE

Hand-held interactive CD unit unveiled – and there's a 'ghetto-blaster' version too page 3

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Xenon features in Preston labour exchange

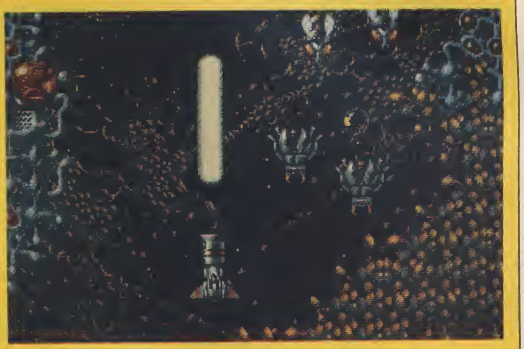
Heavily pregnant Debra Preston was so excited with her score during a midnight game of *Xenon II* that she went into labour and had her baby... but not before she'd finished playing

Debra, a 22-year-old from Tunstall in Staffordshire, is described by her friends as an arcade game addict and a brilliant player to boot.

She was in the midd;le of a game when the contractions came, and both her husband John and an emergency ambulance crew tried in vain to persuade her to put down her joystick and leave her 520 STFM.

But with her highest score ever within reach, Debra decided that the baby would just have to wait.

She went on to complete level four and, with an as yet undisclosed number of points in the bag, allowed herself to be whisked off to Stoke on Trent City General Hospital where baby Tara was born shortly after.



• Xenon II – *more important than having a baby?*

UK cartridges are different shape

• The *US 16-bit Sega – European versions will have different cartridges to imported models*

GAME UP FOR GREY SEGAS

The official UK version of the Sega Mega Drive will not be compatible with grey imports already in the country, *reports Steve Jarrett.*

Virgin's heavy hints of recent months were confirmed at the Paris press launch last week, when it was revealed that the European Mega Drive has differently shaped games cartridges.

This means that even after the official UK launch (which will be backed by a £2.25 million advertising campaign), owners of imported Mega Drives will be stuck with the unofficial market for new games supplies.

At the press junket, eight huge television screens demonstrated new Mega Drive and Master System games such as *Alex Kidd in Shinobi World* and *Super Monaco Grand Prix* – a good looking split-screen, two-player race game. Other titles on show were *Super Thunderblade, Super Shinobi, Thunder Force II* and Super Hang On. Twenty new games are planned to be available for when the Mega Drive goes on sale.

The occasion was held in the gardens of the Hotel de Sully, where there was sushi, bubbly and trampolining children. Scantily clad waitresses bumped into sumo-sized gents while taking in a Kendo exhibition. (*I hope I'm not paying you for this – Ed*).

Pre-launch orders for the Mega Drive apparently amounted to a sell-out and prompted Virgin's Nick Alexander to call it the: "most eagerly awaited consumer electronic launch since the colour TV."

No mention was made at the launch of the modem option which is known to be available for the machine.

Next on CD

Next Technology, the UK company best known for its CD-ROM mastering services for the PC, Mac and Archimedes, will be offering similar production facilities for the new Commodore CDTV.

Besides mastering a Welcome disk for all units of the CD-Amiga sold in the UK, Next will be offering its quick, low-cost pressing service to any software publishers interested. A conversion service priced at a similar level to the company's 'Pressed for Time' facility for the Archimedes, costing as little as £300 for a one-off pressing, is essential to the success of the CDTV in establishing a broad-based applications platform when it is launched here in September.

Data can be imported from any source including slides, video and both IBM and Mac file formats. Next Technology could find itself in a very lucrative position – it has also signed a deal to master Philips CD-I titles.

PC Engine to go on line

PC Engine maker NEC is to put up a free on-line 'bulletin board' and software service for end users. The scheme is expected to come on line in Japan in the autumn and bring together PC Engine users.

Public domain PC Engine software will be available free on the network, and users will be able to up and download games as well. Players won't be able to play games with each other, as the phone charges would make it prohibitive, and the service hasn't been included.

A telecommunication adapter will be available when the service comes on line, and a keyboard is planned as well.

Not wishing to be left out, Sega plans an on-line service too. Mega Drive users will also be offered dowloadable games software, but will have to pay for the privilege.

The launch of Nintendo's planned Entertainment System Network in the US has been postponed from this summer to some time in 1991. The service will offer interactive entertainment, on-line information and electronic mail, although the company has dropped out of one deal to create a financial services package and is looking for another partner.

Interactive CD computer prices will drop in time for UK launches

HAND-HELD CD-I MACHINES WAITING IN WINGS AT SONY

To a packed audience of leading consumer electronics executives assembled in London last week for the world's first Multimedia Conference on Interactive CD, Sony's executive director, Nobuyuki Idei, unveiled his company's latest technological breakthroughs – three portable CD-I players.

Fully compatible with the CD-I standard pioneered by Philips in association with Matsushita, Polygram and Sony, the tiny hand-helds incorporate 5-inch CD drives with colour LCDs, video-out jacks for display on televisions and CD audio quality sound. At an as yet unnannounced price, the three machines look likely to be publicly previewed in Las Vegas at the autumn Comdex.

Sony's is pitching its CD-I players as "Picture books with sound, and sound with pictures". The design of the new models is not dissimilar to the current portable CD DISCman and ghetto blaster/CD machines – what the hi-fi press call 'yuppie blasters' – but with built-in LCD screens.

The company's intention is to mass produce easy-to-use, high-quality, low-cost players which will become the *de facto* entertainment system of the 90s and bridge the home, office and corporate business markets.

CUSTOM CHIPS

In other developments at the conference, leading chip manufacturer Motorola announced its intention to produce a custom CD-I chip set based on the 68000 with a 32-bit graphics processor, 24-bit audio handling and video chips allowing full-screen, full-motion video.

By Andy Storer

This 'silicon solution' will pave the way for mass VLSI (very large scale integration) production of CD-I machines, destined to be delivered into the professional markets early next year, and will help to complete the CD-I's full range of audio-visual capabilities.

PRICES FALLING

To further consolidate the new medium's market potential, already supported by over 100 licensed publishers and hardware manufacturers, Philips announced its CDiNavigator system, an authoring package including hardware, priced at only $9900 and offering 'point and click programming'.

Philips now expects domestic CD-I players to be available in the UK by 1992, with prices dropping significantly from the $1,000 price point projected for their US launch next year – this will be made possible by mass production and VLSI.

With the company heralding CD-I as the birth of 'Television with a mind of its own – yours', representatives from every major consumer electronics company except Atari and Commodore were present at the showcase event.

Although Atari's attitude to CD-I remains ambiguous, with US executives keener to leap on the bandwagon than their UK counterparts, *Express* can reveal that several Philips technicians have been seconded to Commodore in the United States to work on CDTV/CD-I project liaison – the Amiga CDTV is actually manufactured by Matsushita, one of Philips' CD-I partners.

• Sony's CD-I version of the 'yuppie blaster' – a must for rich skateboarders everywhere

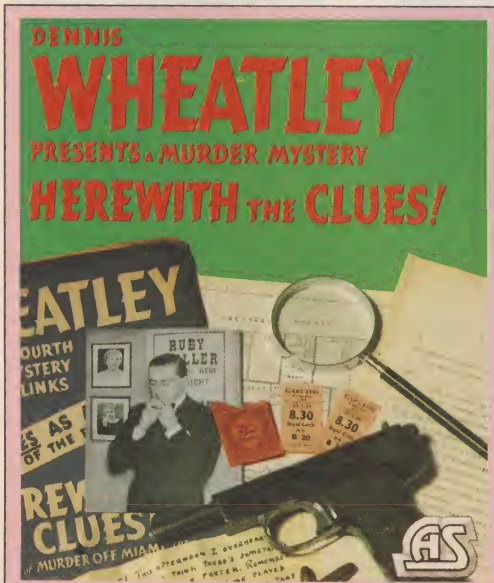
While interested parties such as Amstrad, BBC Enterprises, Rediffusion, Nimbus Records and Virgin quietly maintained a low-profile attendance, American and Japanese consumer giants abounded. JVC, Epson, Sanyo, Fujitsu, Toshiba, Yamaha, Ricoh and Pioneer all either showed or announced CD-I players.

SOFT OPTIONS

On the software side, CBS/Sony and RCA/Columbia Pictures demonstrated new titles, with prices ranging from $15 to $50, aimed at the educational, entertaiment and information markets.

American Interactive Media, a joint Philips/Polygram venture headed by ex-20th Century Fox personnel, unveiled 10 new interactive entertainment titles. Several European publishers announced support, prominent among them Maxwell Communications whose Nimbus Records division announced capability of pressing 9 hours of CD sound on a single CD-I disk, and Bertelsmann which plans to launch a series of CD-I travel guides of European cities and tourist sights.

Other elements of the conference were thoroughly eclipsed by Sony, though. Nobuyuki Idei's concluding remarks set out the future Sony has planned for us all. Digital video tape recorders, high-definition TV, digital audio tape and CD-I in every home by the year 2000, based on chips with 64 times more power and ten times more speed than those currently available. ■



• Herewith The Clues – sleuthing simulation for the Archie

Game for gumshoes reaches Archimedes

Dennis Wheatley's *Herewith the Clues*, already a popular puzzler on the ST and Amiga has brought its own brand of sleuthery to the Archimedes. The £24.95 whodunit casts you in the role of detective who must sift through photographic evidence in search of a brutal murderer.

You start with a single screen, and moving the pointer to various things on it brings you access to biographical details and a library of suspects. Armed only with your powers of deduction, your task takes you on a search through the unsavoury details of many people's lives.

When you think you have solved the crime, there's a competition. Send your solution to CRL and if you're right, you get a scroll confirming your ability. If you're wrong, try, try again.

The PC version is expected in a few weeks, and more information is available from CRL on 081-533 2918.

• The Archimedes version of *Herewith The Clues* was written with the Archie version of DUNE, the games programming utility. ■

Still life satellite

The days when scratching an itch could gain you a Van Gogh and cost you an ear and a leg might be over. A company called Lasernet haslaunched an electronic catalogue for fine art and antiques auctions.

Anyone wishing to participate needs to buy a terminal, satellite dish and decoder. Photographs of saleable articles are sent into Lasernet where they are digitised and then, with their histories and prices, beamed world wide to subscribers. Sold articles can be rapidly removed from the system. ■

Wrist top pager

A wristwatch that incorporates a message pager is being marketed in the US.

The Seiko Receptor uses the watches digital display to show a 16-letter message and the memory can hold up to 8 messages.

Seiko hopes to sell a million Receptors in three years and plans to distribute it in Europe and Asia within a year. ■

Leningrad micro would cost a Russian 13 years' worth of salary

SOVIET HOBBIT COVERS THE RED END OF THE SPECTRUM

By Keith Pomfret

Beyond the recently-parted Iron Curtain is Leningrad-based InterCompex, a Soviet hardware company specialising in personal computers. InterCompex designer Dmitri Michailov and director Michail Osetinskij brought their new Spectrum-emulating Hobbit to Britain earlier this month to test the waters in the West.

On a visit to the *Express* offices, Michail Osetinskij said: "The Hobbit is popular in the USSR, but it needn't stop there. It can support any alphabet or character set so it could be exported to the developing world where they need technology that is easy to build, repair and understand." He added that the UK was a possible market, too.

The off-white case, with its strange Cyrilic/Roman 74 keys, looks austere next to the modern monitor that we used to test it. As well as the Sinclair operating system, a ROM-based utility is included that allows such functions as the disassembly of machine code and program monitoring.

Designer Dmitri Michailov said: "The only thing that holds back production is the lack of memory chips."

The USSR produces relatively few chips, and InterCompex usually has to barter for its share, often trading food to factories which won't take roubles. Michailov continued, "The design and specification means that thre is a great demand for the Hobbit and it's a shame that we can't make more." He added that they hoped to source chips in the UK, but that prohibitive currency exchange rates could make it difficult to purchase them.

NET ASSET

A couple of full size 5.25-inch drives in a black metal case gave the machine an air of functionality. After a whirr as they initialised, we were treated to... no, not *Tetris*, but a networking program. The Soviets have a collection of over 2,000 Spectrum programs but the emphasis is clearly on work, not play..

The computer scene in Leningrad is different to the one we know here in the UK. Michaiklov said: "There are at least 20 different kinds of Spectrum compatibles in Leningrad. In the USSR if you want a computer, you must make it yourself. You take out your soldering iron and hope that someone has the plans."

He added that the Hobbit was the only 'official' Spectrum-like computer behind the Iron Curtain, and that with no western copyright laws in the USSR, anyone could copy software or hardware without official reprisal.

• InterCompex's Hobbit. One of 20 or so Soviet Spectrum compatibles.

Technical specifications

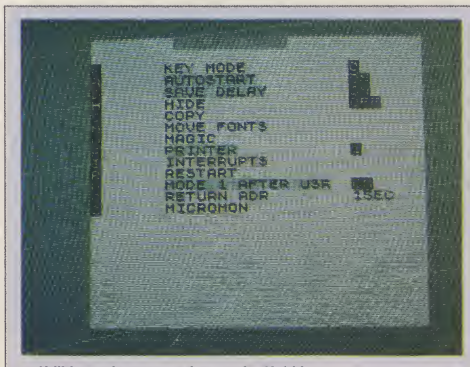
The Hobbit has a single piece keyboard and processor unit with a Z80A processor, running at 3.5 MHz. Additionally, it has 64K of addressed memory, a ROM operating system (16/8/0 kilobytes depending on system configuration), and it is RAM paged as 48, 54 or 64K including 6.5K screen memory.

Additionally, the Hobbit offers a range of interfaces including system bus, parallel port (centronics), RS232 and three joystick ports (2 Sinclair, 1 Kempston).

The keyboard has 74 keys, including 33 reprogrammable function keys. It adapts to provide Cyrillic/Roman/Arabic alphabet support, and it sports a 'soft' programmable keymap.

The disk controller is mastered for both 5.25 SS/DD and DS/DD drives, and it supports up to 4 drives – two are included. Power supply is in the range of 220-240V at 50/60, while display is via a TV or standard 9-pin TTL PC monitor.

The Hobbit can run BASIC, a network Driver up to 100KBaud, CP/M, high level languages available in ROM (Pascal, Forth LOGO, C) and an on-board assembler, plus all Spectrum programs including games.



• Utilities software running on the Hobbit.

Rouble trouble restricts ownership

To own a home computer in the Soviet Union is unheard of. The average wage is about 250 roubles per month and a PC can cost 60,000 roubles. This amounts to around twenty years' salary. Even the Hobbit comes out at an expensive 40,000 roubles. With prices like these, it should be a long time before the Hobbit becomes obsolete.

It is only institutions, companies and educational establishments that have micros. So far 15,000 Hobbits have been distributed to Soviet schools. The machine can be networked, and any one in the network can take the role of host computer. If for any reason the host crashes, any other networked machine can take over, and in many cases can access the crashed machine and retrieve files.

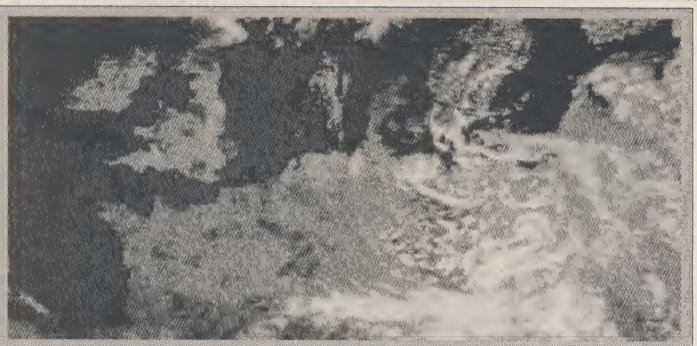
As well as networking with other Hobbits, connection to larger host machines such as PCs or even mainframes is possible. Thus a teacher can run a class, networking Hobbits to a PC with high density storage. Work done on the Hobbit can be handed into the teacher's computer via the network.

The Hobbit's specifications demanded that it interface with a variety of printers, drive TVs or monitors, run high level languages such as BASIC and LOGO from ROM, and connect directly to Sinclair and Kempston joysticks.

PC-based weather better who doesn't want better weather

Piers Corbyn, an astrophysicist at London's South Bank Polytechnic, regulary uses his IBM PC to win a few hundred pounds a month.

He avoids the gee-gees and steers clear of the football, his betting – generally 25 bets of £20 a month – centre on the weather. Corbyn provides long range forecasts for a company called Weatherplan. They have been correct for 7 out of the last 10 months. His lastest punt is an accumlator. The stake rides on the hope that rain will effect the first day of four major sporting events; the Derby (correct), the 1st Test (correct), Royal Ascot (we're not too sure) and Wimbledon, which Mr Corbyn predicts will be wetter than Jaques Cousteau's drinks cabinet. ■



• The weather is safer than the dogs.

Game over, it's the Fed

A computer game has been installed in the corridors of Washington's Federal Reserve. The idea behind the game is to stave off boredom for visitors to the establishment.

People awaiting appointments can put some of their money in the slot and then pretend to be Alan Greenspan, the Chairman of the Reserve.

Strategies revolve around fighting the threat of inflation or battling the forces of recession. All good clean fun – unless there's a Boesky option, that is. ■

Nelson's tape

A traditional ticker-tape welcome for Nelson Mandela in New York nearly came a cropper. The reason... no ticker-tape. Since the computer took over as the Big Apple's main machine, tape supplies have dried up.

The answer was to import 150 miles of paper ribbon which arrived, in 85 bags, the night before the parade. This was backed-up with shredded faxes and ripped up 'phone books. It's not known how Mandela stands on Green issues. ■

'Lost' names to cost St Albans' tax payers £9 each

COMMUNITY CHARGE COMPUTER CHAOS

A computer error has been blamed for yet another extraordinary Poll Tax foul-up.

By Colin Campbell

St Albans' Council last week announced that Poll Tax payers would be charged an extra £9 a year to make up for monies lost due to no-payers. However, non-political non-payers are complaining to the council about people who have fallen off the register.

Like most UK councils, St Albans has spent thousands of pounds installing an efficient system suitable for such a large scale operation as tax registration. But the computer program, designed by ICL, has somehow lost the names of 3,000 eligible payers. St Albans council says that it can't realistically attempt to track down the missing names without a fully functional computer program. The shortfall is costing hundreds of thousands of pounds.

A spokesperson for the council was reluctant to give details but said that the fault lies entirely with the computer. St Albans isn't the first council to be troubled by computer gremlins. Hundreds of people have filed complaints after receiving Poll Tax demands for babies or even dead relatives. Last year one group of anti-poll tax campaigners claimed to have inserted a virus inside the Lothian and Tayside regional computer.

The virus was deleting one name every 15 minutes and replacing it with the name of a dead, comical or nonexistent person. That council was quick to check the system and emerged claiming that no such virus had been found despite the numerous reports of curious Poll Tax forms received in the area. ■

Side by side with Chuckie

At long last, Chuck Yeager's *Advanced Flight Trainer* is available for users with ST and Amiga machines.

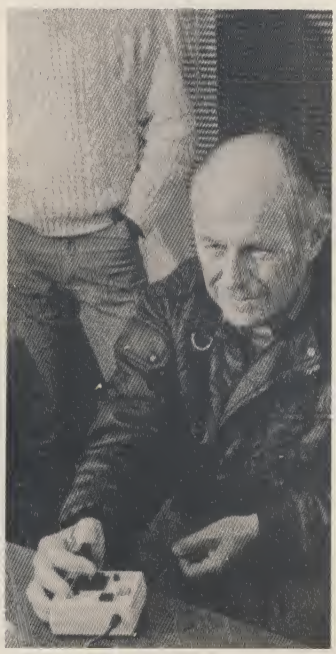
General Chuck's teach-yourself-flight sim has long been a favourite on the PC, with boardrooms around the country thrilling to the sound of young executives screaming things like 'Neeeeoow' and 'Daka-daka-daka'.

Even owners of 8-bit machines have learnt the joys of high-speed air racing, with granite-jawed Yeager acting as the hard-bitten, yet friendly, co-pilot.

The new 16-bit version comes with an audio tape which has the old man himself guiding you through horrendous loop-the-loops, acrobatic dives and general barnstorming activities.

You're not stuck with one plane either, with the *Advanced Flight Trainer* you get to fly 18 different 3D-modelled aircraft, including the Space Shuttle and Stealth fighter. Multi-aircraft formation flying, racing and an on-screen 'Six Day Flight School' are also part of this deluxe package.

All this will set Amiga and ST owners back the sum of £24.99. For more information on the package contact Electronic Arts on 0753 49442. ■



• At long last, Chuck's on the ST and Amiga.

Paperlike Interface makes life easier for PC scribblers

How would you like to be able to scribble a few notes directly into your computer just as if it were a notebook?

This dream has been around the computer industry for many years, and finally there is a possibility that the Paperlike Interface, from IBM, could be the answer to this tough nut.

Still in experimental stages, the interface is said to be able to recognise handwritten characters and even hand-drawn marks such as lines, mathematical symbols and musical notes. IBM reckons that 'gestures' on the tablet – possibly something like printers' proof marks could also be used as commands.

The Paperlike Interface uses a stylus as a pen, a transparent digitising tablet and a flat liquid crystal display.

Pundits are wagering that, whatever else it can do, it still won't be able to read Doctor's handwriting. ■

Ten years hard labour

The next decade is reckoned to have been sussed by the Labour party – at least in terms of technology and education.

Dr Jeremy Bray, the spokesman for science and technology, outlined the game plan. If Kinnock's crew makes it into government we might expect the following:

Far greater use of CD-ROM and Interactive Video (IV). Regular software and hardware upgrades will be made at least every three years by central government. Big business will also be welcomed into schools and colleges.

The companies can use the educational sites for research and development – the pupils and staff will get new equipment for little or no outlay. ■

EC rules force one-box plan to be reconsidered

MODULAR MOVE FOR NEW LOW-END MAC

By Martyn Lester

The UK's low-end Macintosh is now likely to be an easily expandable modular machine, according to continental *Express* sources, and will be one of three new modular Macs to be marketed in the near future.

The decision has apparently been taken partly because new European Community laws on monitors in the workplace (which will eventually see the old Mac 9-inch screens outlawed entirely) are expected to come into force early in West Germany.

Some pundits still believe that Apple will launch an all-in-one-box low-end machine with more rounded styling than the current angular Plus and SE machines, and this will almost certainly be the case in the US.

It is possible that for Europe there will be an either/or option on two styles with the same technical specifications.

However, sources close to the top of Apple Europe are hinting strongly that they see no point in producing two radically different versions of the entry-level machine for the European market. Furthermore, the modular Mac with separate monitor is a cheaper machine to manufacture, allowing Apple to bring in its new low price policy while maintaining acceptable margins.

Any US-style single-box machine would be fine for home or education use, but during 1992 would become unsaleable as office equipment across the EC, as Community regulations will require tilt-and-swivel monitors in the workplace.

Apple personnel remain as tight as clams regarding the price of the proposed machine, but third-party developers in the know believe that the entry-level version will be pitched to attract the type of buyer who may otherwise be looking at ST and Amiga models. Prices between £700 and £800 are rumoured, with monitors extra.

• The new entry-level Macintosh is now expected to look like this IICX rather than an SE.

The basic, floppy drive only machine is expected to come with 1MB of RAM, a new version of System 6 and either 8-bit colour capabilities or a cheap upgrade to colour. To run System 7, due at the turn of the year, it would have to upgraded to at least 2Mb or RAM, but its 68000 processor would not be able to make use of the new operating system's virtual memory capabilities.

The other two modular machines expected are a hard disk version of the entry-level machine and a direct replacement for the current SE30 model.

• FBI gives the thumbs-up to computerised fingerprinting – really!

FBI puts the fingers on

The Federal Bureau of Investigation has got so far behind with its archaic manual fingerprinting system that it is spending $185m on computerisation to catch up.

The facility will include a sophisticated automated system that can match a print with a database of 25 million others and give a turnaround time of less than two hours.

The present system recieves over nine million cards per year and with 700,000 fingerprint cards unprocessed, a criminal could offend again because the relevant card is still in the system and identification hasn't been made.

Stanley Klein, of the FBI fingerprint division said: "Say one of those people on those cards is a killer. By the time we get the information back again, he's killed again."

Fast phones

Canada is being treated to some fast phonelines with the Bell Sonet (Synchronous Optical Network). The new network can carry voice, data and video over optical fibre cables, and each strand has the capacity for 32,000 simultaneous phone conversations

The system whizzes along at 2,488 gigabits per second, which is 259,166,666 times the speed of Prestel.

Gates plans for palace

Bill Gates, otherwise known as the boss of Microsoft, is building a 45,000 square foot underground mansion with the fortune he made from selling software.

The soon to be built $10m home will be placed on the shores of Lake Washington in Seattle. The mansion will have a 20-car garage, three kitchens, a theatre, reception and dining rooms, a swimming pool and sports courts – but the exciting part of the project is that it will be over 80 per cent underground.

The 4.5-acre site will be developed to incorporate a dock, an artificial estuary and a creek. All right for some...

A chip named Sue?

The 68030 processor, which lies at the heart of the new Macintosh FX as well as the Commodore A3000, may be pulled from the world market if a judgement by a Texan judge takes effect.

This action stems from the long-running wranglings between Motorola and its former partner Hitachi. Both firms have sued and counter-sued over copyright infringments and patenting problems relating to the 68030.

Hitachi's H8-532 chip is also a problem child, and a ban affecting this might not be too far away. On March 29 sale of the chips was banned and both companies were fined for violating each other's patents. In a very fast reversal of the situation, March 30 saw the ban lifted.

Hitachi returned to Judge Bunton and he has indicated that a further embargo might be in the offing. Motorola doesn't appear to be too worried – it has launched an appeal which will probably reverse the decision yet again.

Out of court, Hitachi and Motorola are said to be 'dedicated to resolving the issue'.

Keystroke-driven

Every good boy deserves food. The response to this well worn fact from people who have suffered at the hands of sadistic piano teachers is normally: "Arghhhhh".

American firm The Software Toolworks aims to change all this with a new product for the Nintendo Entertainment System.

The Miracle Piano Teaching System, which costs $299.95, comprises a specialised electronic keyboard – which can also work as a stand-alone device – and an interface.

It also uses an artificially intelligent system which monitors bum notes and other problem areas in order to structure the teaching to the pupil.

There are also 'customised video based lessons' to take students from one-finger ineptitude to one-finger proficiency in a matter of hours.

Diddley Dudley Moore, an accomplished pianist better known for his escapades with Peter Cook, Bo Derek and Tesco chickens, has been named as musical consultant for the system.

COMMENT

Has Commodore's month-old CDTV already been eclipsed by the rival CD-I system? This week's Comment is by Andy Storer.

After the Walkman and Watchman, Sony unveils what will probably become known as the CD-IMan. Announcing a portable CD-I unit before desktop versions have even appeared may seem a little surprising, but this is exactly the kind of innovation we have come to expect from the world's leading consumer electronics company.

On reflection, it seems an obvious move; the only logical conclusion. For if you combine audio and video portability in one hand-held unit and add the excitement of interacting with anything from a flight-sim to a French course, you have a product all set to soar through the sales counts.

Of course, prices will be steep to start with. The early Walkmans came in at just under £100, a purchase price nearer to £200 today after taking inflation into account, and yet you can now walk along your High Street and pick one up for under a tenner. It might not be a Sony but it's a portable cassette player. But how long will it be before we can buy Saisho CD-Is from Dixons? Perhaps sooner than you think. At any rate, a lot sooner than an Amiga-compatible Saisho CDTV.

For Sony has worked in close conjunction with two of its immediate competitors, Philips and Matsushita, to ensure the system's success. The vital ingredients? A user-friendly, low-cost, high-quality world standard combining every medium under the sun. Video, photography, animation, graphics and CD quality stereo sound all in the one magic box of a multimedia machine.

We're talking big bucks in a big league here, and the CD-I inititative is one based on the confidence of knowing that the customer will flock to the new medium. Walkmans and Discmans, even Gameboys and Lynxes – they sell like hot cakes to the architypical consumer – the bored commuter.

But the biggest bucks are to be had in the home. Education, Information and Entertainment are the key words uniting family needs, and the current systems designed to meet them are geared towards transparent technologies. That's why IBM isattempting to muscle in on the biggest market of all with a low-cost integral system. This too is the positioning behind Commodore's CDTV.

Punters never overcame the first wave of techno-shock. What they want now is a computer that looks like a Hi-Fi, is easier to operate than a video and more useful than a TV. On all these counts, both CD-I and CDTV score heavily. They offer point and click control, access without effort and fun without tears; the days of the Command Line Interface Hard Men are over – the WIMPs have won the day.

But that's where the similarity ends and economies of scale take over. With the backing of the three largest consumer electronics companies in the world, CD-I will benefit from mass production and large scale integration in a way that Commodore can only dream of. 'The Price is Right' may never pass the lips of potential CDTV purchasers.

At the moment Commodore's machine is out on its own, but it only has something like six months to take the high ground. Beyond that the CDTV could be submerged in a sea of 16-bit games conversions at the expense of a handful of 'serious' titles for a machine that can't afford to drop its pricing. Commodore had a CD-ROM machine built by Sanyo some eighteen months ago. It may now have left it too late.

FROM the ARCHIVE

ONE YEAR AGO

A heinous virus known only as Datacrime was discovered doing the rounds of PC systems.

Instead of the usual Friday 13th viruses, this one was designed by its devious creators to do its stuff on October 12. By catching it three months before its deadline, however, vaccines were prepared and damage was limited.

There were groans of anguish emitting from every PCW-using quarter as a batch of defective *Mini Office Professional* disks was released by mistake.

The already delayed package slipped out with a spelling checker that didn't work, a word processor that couldn't load *Protext* or *LocoSript* files and an American thesaurus.

A report from the National Curriculum Council said that the brightest pupils should be able to create, amend and present text on a word processor and enter, select and retrieve fields in a database by the age of seven.

Atari, desperate to break Nintendo's hold on the US games market, had its plans trashed by a court injunction preventing the marketing of *Tetris* in the US.

Retailers already stocking the Atari *Tetris* cartridges were advised to remove the games from shelves.

The court ruled that Nintendo had, in fact, purchased the worldwide rights to *Tetris* on home video game systems direct from the Soviet government.

Commodore made another thrust at Amstrad's share of the low end business market with a PC bundle that included Ashton Tate's *Framework* 2.

The £1,091 XT clone bundle was aimed squarely at the Amstrad PC2086, which at the time was bundled with Lotus *Symphony* at £1,148.

One year on and Commodore has changed its marketing strategy twice without making any great impact on Amstrad.

Rombo Productions' eagerly-awaited real-time video digitiser for the Amiga was delayed due to problems in the HiSoft BASIC compiler which was used to write the software.

The program did arrive eventually, and by all accounts was worth the wait.

Micronet put together a package for yearly subscribers to beat the 15 per cent VAT slapped on by the Government. A 3,000 strong petition had failed to persuade the then Chancellor, Nigel Lawson, to reconsider the new tax on its services.

In the 007 film *Licence to Kill*, the multi-million pound drug barons were seen using the sub-£50 database *Masterfile* to keep track of their dastardly deeds.

The incredibly creative reason behind such a move? The film's producer used *Masterfile* to catalogue publicity stills, so it was available and at hand.

Zenith was first to jump into the fax-on-the-move market with the 286-based SupersPort, complete with a built-in fax modem.

It was 'fully approved' and compatible with the majority of the world's telephone systems.

Cynthia Payne, Britain's most famous madam, opened her problem line on Micronet.

Keying the appropriate page number could take you straight to the lady's boudoir, where she gave her own particular brand of reply to people's problems.

A report suggested that the 20 million users of Visa and Mastercard (Access in the UK) would soon be treated to 'Smart' replacement cards with a range of uses hitherto not available on a credit card.

And the quote of the week from David Kelly of Cambridge Software International :
"With the Archimedes' capability for graphics it's obviously the ultimate games machine and we want to make a lot of money out of it."

(Sources: *New Computer Express* and *Computer Trade Weekly*.)

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We regret we cannot enter into any personal correspondence or answer telephone queries. Technical enquiries should be addressed to Tech Tips at the address below.

ABC audited circulation July-December 1989: 22,277 copies per week

© Future Publishing Ltd • 30 Monmouth Street, Bath BA1 2AP • Tel: 0225 442244 • Fax: 0225 446019 • Subscriptions: The Old Barn, Somerton, Somerset (0458) 74011
• Printed by Redwood Press, Melksham, Wilts
• Distributed by Comag, West Drayton, Middx

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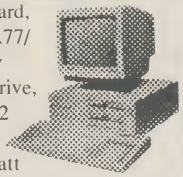

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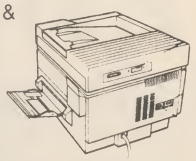

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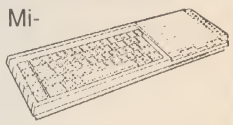

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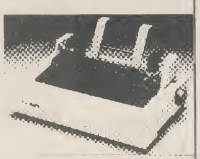

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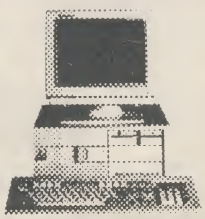

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SWEET SUCCESS

Book publisher, Century, is about to release a new book called *Alan Sugar – the Amstrad Story*, it will coincide with the 10th anniversary of Amstrad's flotation. It starts with 'Big Al' selling car aerials in the East End and ends with 'one of the richest men in the country'.

The author is David Thomas, who has worked for the *Financial Times* for three years, as electronics correspondent, and he draws extensively on interviews with key industry personnel close to Alan Sugar. Price is £14.99, and Century is at Random Century House, 20 Vauxhall Bridge Road, London SW1V 2SA: phone: 071-973 9670.

RIPPER GETS THE BOOT

On the letters front, I've received an interesting communication from a company called Visual Images. It's about a new game, which... well, I think I'll quote the letter...

'Our company is soon to release an adventure based on the true story of spring-heeled Jack 'the Demon of London'. The player takes the position of the Duke of Wellington who, even though 70, arms himself and chases the 'creature'.

'It will be on released at a price of £9.99 first on the Amstrad, then followed by other 8-bit releases, sporting some complex puzzles to keep even the best player hooked for days.'

So – if you want to play a 70-year-old Duke of Wellington, er, chasing Jack the, um, Ripper through, er... Anyway, the address is: Visual Images, 21 Inmans Road, Hedon Nr Hull. Blimey.

BOMBFUSION POKE

This comes from that veritable wizard, Andy Price from Dunstable, and it gives you infinite lives on the tape version of Mastertronic's blow-'em-up.

```
{NnAo} 1 ' Bombfusion
{JsAq} 2 ' by Andrew Price
{BxAq} 3 ' Amstrad Action
{ExAs} 4 ' Infinite lives
{NvAs} 10 DATA 21,66,3B,06,0D
{DvAr} 20 DATA AF,77,05,B0,28
{GwAs} 30 DATA 03,23,18,F7,3E
{LjAr} 40 DATA C3,32,E3,3B,3E
{EpAs} 50 DATA 20,32,E4,3B,3E
{HpAt} 60 DATA 3E,32,E5,3B,CD
{MtAs} 70 DATA 60,3B,E5,F5,D5
{OrAr} 80 DATA C5,DD,E5,FD,E5
{AqAs} 90 DATA 21,E3,3B,3E,3A
{ItAs} 100 DATA 77,23,3E,40,77
{AjAt} 110 DATA 23,3E,86,77,AF
{FtAt} 120 DATA 32,71,4A,FD,E1
{HnAu} 130 DATA DD,E1,C1,D1,F1
{IlAr} 140 DATA E1,C3,E3,3B,00
{InAp} 150 DATA 00,00,00,00,00
{BpAq} 160 DATA 00,00,00,00,00
{AoAn} 170 DATA A.P
{OtBj} 180 MODE 1:PRINT"LOADING...-
":MEMORY &3B5F
{EmAt} 190 LOAD"BOMB
    FUSION",&3B60
{FoAo} 200 chk=0:x=&3E00
{CxBs} 210 READ a$:IF a$=
    "A.P" THEN 230 ELSE
    a=VAL("&"+a$)
{LrBi} 220 POKE x,a:x=x+1:
    chk=chk+a:GOTO 210
{GvBq} 230 IF chk<>&217C THEN PRINT
"DATA ERROR.":END
{KoAo} 240 CALL &3E00
```

MORE MATURITY

"Another thought for Mr Peck," writes John Hudson of Huddersfield in response to the Mr Peck's letter in this column in *Express* 84, "is the spreadsheet module of *Mini Office II*.

"This will cope with up to 500 active cells and, in spite of only having five operators (+, -, *, and # or SUM), will cope with remarkably complex calculations if you split them into stages and use cells outside the area you might want to print for those intermediate calculations.

"The graphics module is also well worth exploring and can produce better graphs than some programs that need incredibly big machines to run on.

"Alternatively, if he is more interested in improving the appearance of the church newsletter and doesn't have a desktop publishing package, he could have a go with *ProScript* (£8 from DW Software, 62 Lascelles Avenue, Withernsea, North Humberside HU19 2EB.)

Thank you very much for your tip, Mr Hudson of Huddersfield.

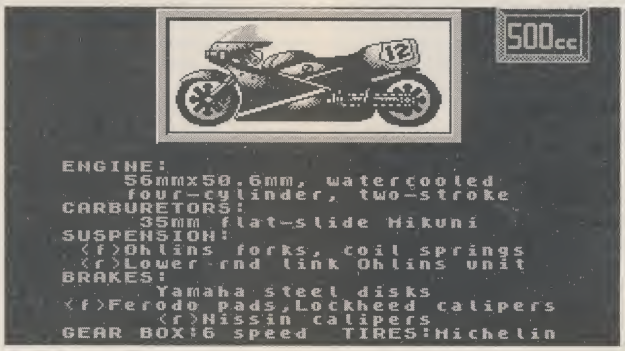
Rod Lawton

PEDALLING BACKWARDS

There are funny things going on down at Accolade. A few months back the company brought us the utterly excellent *Jack Nicklaus Golf*, a few weeks later came the dismal *Test Drive II*, and now along – after a good dose of hype – comes *The Cycles*, a 3D grand prixe bike racing sim, which is even more disappointing.

All the signs were good. You can select your own machine and circuit, for a start, and you are offered a rider's-eye-view of the tarmac as it unrolled beneath your wheels.

That was the theory. In practice, *The Cycles* just looks like *Test Drive* in drag. Admittedly, it runs a lot faster than even the second version of the car sim, but it still has that one central problem. It's much, much too slow.



• Choose your trusty steed – and then spot the difference on the track!

Anyone expecting the breathtaking pace of *Hang On* will be disappointed to find the thing runs more like *Castle Master*! This lack of any real sense of speed is a major problem.

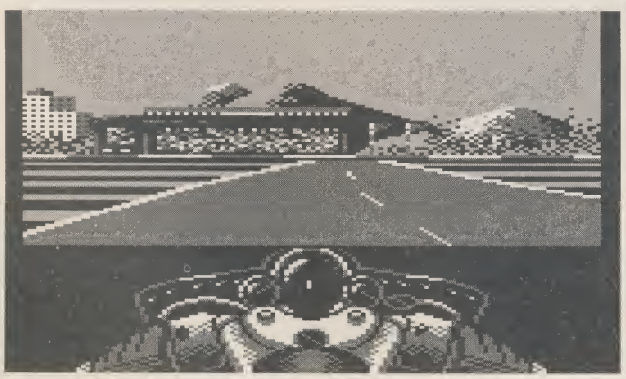
You could be doing 15mph or 150mph – you'll only find out five seconds into a corner, when you plough off the road no matter how hard you grab the brakes or how fast you slam down through the gearbox.

And even if you do succeed in staying on the track, it's only by such monumental overcorrection that you fishtail on and off the track for the next half minute, doing a better job of mowing the grass than scorching the tarmac.

Against this basic lack of playability or immediacy, other quibbles are minor. The worst is probably the handlebars on the bottom part of the screen.

You could be hanging, Mamola-style, off the bike with your backside on the tarmac at 90mph round a hairpin, and those handlebars on your screen will stay steadfastly upright. Part of the central feel of motorcycling is leaning into corners, but with *The Cycles* that's entirely missing.

Enough said: like *Test Drive II*, The Cycles undoubtedly represents some pretty nifty and ambitious coding. Unfortunately, it just doesn't come off.

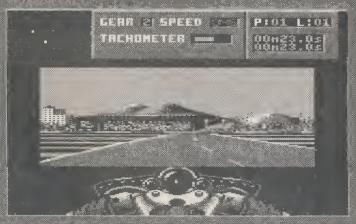


• The Cycles: That track may look wide, but just you wait...

YOUR FORMAT

MACHINE SPECIFIC COLUMN

CPC 9



• The Cycles: a curious offering from Accolade.

Spectrum 10

SAM Coupé 10

PCW 10

MSX 10

QL 11

BBC 11

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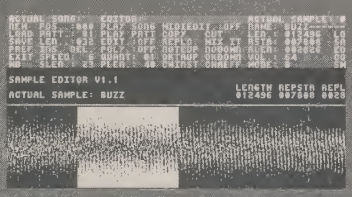
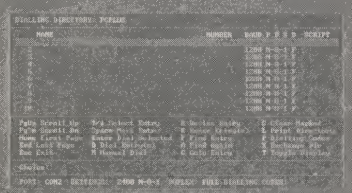
C64 11

Amiga 12



• Hold on to your trebleclefs: it's Octaliyser.

PC 14



• ProComm Plus: how to do it.

ST 16

• Sim City on the ST: hurrah!

SPECTRUM

IT'S DESTINY

Destiny Mission, the first release from a one-person software house called Williams Technology, with its minimalist packaging, comprises one inlay-less cassette case and a sheet of typed instructions. What it lacks in the way of 'free' posters, novellas, stickers, soundtrack cassettes and the like, it certainly makes up for with some slick professional programming and a mighty addictive line in gameplay.

It's a horizontally-scrolling shoot-'em-up with the accent on, er, scrolling horizontally and, um, shooting things, as you singlehandedly guide your ship through eight levels packed to the pixels with nasty alien types.

Traditional genre features that you expect to find in any blaster worth being played with joystick in autofire mode are present here – like tokens to upgrade weapons, pneumatic crushers to fly through or be squashed by and, of course, the essential end of level mega, mega nasty.

Anyone who has played a fair smattering of classic shoot-'em-ups will recognise the influences, and in terms of originality – well, there isn't much of that. Technically, however, it's great, with some crisply-drawn graphics, excellent snappy sound effects and a parallax back, middle and foreground that scrolls so smoothly it just has to be done with mirrors.

The monochrome colour scheme does mean, unfortunately, that there's the odd case of disappearing bullet syndrome to contend with, and I think maybe hardened joystick wagglers will find it a bit easy (I got to level six).

All in all this is easily as good as most of the sumptuously-packaged commercial Speccy products you'll find in your local software shop. That shouldn't really be surprising because the programmer/publisher, Tiny Williams, was also responsible for the Spectrum version of *Xenon*, and we know how good that was.

Having got: "little credit and even less money" for it, he's decided to publish his work himself, and *Destiny Mission* is available mail order only at the moment for £7.95.

I reckon that might be a few pennies too much, but this would be a worthy addition to anyone's collection.

Robin Alway

A FEW MORE POKES

We should all be grateful to good old Matthew Wilson who's just heaved another batch of his finest multiface pokes in my direction.

To get any of the infinite benefits the following offer, you'll need to insert them into the appropriate game with a Multiface or similar interface. Thanks, Matthew!

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Rolling Thunder	39792,0	Infinite lives
Stormlord	56877,0	Infinite lives
Rampage	56693,0	Infinite lives
Robocop	31007,0	No enemies

SAM COUPE

CUT THE TAPE

Samtape 2 is here, and it includes an enhanced manual and full instructions to allow customisation and transfer of *Tasword* 2 to the SAM.

Price is £9.99 (considerably less if you're coming from the original) from Lerm, 11 Beaconsfield Close, Whitley Bay, Tyne and Wear NE25 9UW. Send an SAE for details.

SAMCOMPO: THE WINNER!

The winner of that much too easy Coupé competition I ran a few columns back was lucky old Colin Henderson of Glasgow. The person who wrote SAM-Basic was, as if you didn't know, Dr Andy Wright.

Congratulations to Colin, a piece of sparkly new SAM software should be winging its way to him shortly. Thanks to everyone else who entered.

The last little Coupé program I printed seemed to go down pretty well so here's another small, but perfectly formed, little routine with impressive results. The impressiveness of the results shouldn't really come as any surprise because it's by Hamish Rust.

Hamish is a regular contributor and one of the talented types which programs the *Enigma* tape magazine (review next issue) for the Spectrum and SAM.

What more need I say apart from thank you very much, Hamish – and, you can select any speed between one and five:

```
1 INPUT "SPEED?";P: LET R=1: LET S=1
2 LET C=1: FOR G=R TO R+(S*5) STEP
   S: PEN C: CIRCLE 128,80,G: LET
   C=C+1: NEXT G: LET R=R+ (S*5):
   LET S=S+1: IF S < > 8 THEN GOTO 2
3 FOR GO=0 TO 9: PALETTE G,0: NEXT G
4 FOR G=1 TO 5: PALETTE G,127: PAUSE
P: PALETTE G,0: NEXT G: GOTO 4
5 REM ENIGMA TAPE MAGAZINE 1990
```

Robin Alway

PCW

COVER VERSION

As anyone who has ever looked inside a PCW monitor or keyboard will tell you, there are enough layers of dust there to keep an archaeological dig happy for as long as it took *LocoScript PC* to come out. (Only joking, everyone at Locomotive!) The answer is, of course, to buy a set of dust covers.

Owners of the 9512 with the cut sheet feeder have had a problem though; dust covers aren't made to fit the printer with the feeder attached. Until now. Real dustbusters, Jenart Design, on 0769 54127 will sell you a set of covers to fit the 9512 with or without sheet feeder for £15.25.

MUSIC MICRO PLEASE

From my current job on the classical music magazine *Classic CD*, I know that many of our contributors use PCWs – including some well-known concert recitalists.

One (who shall remain nameless) is clearly more at home with a Steinway keyboard than a PCW, and if he were to play like he types, his Beethoven would sound like Schoenberg.

Anyway, musicians or music students with PCWs will no doubt know of the *Composer's Pen*, an excellent music manuscript writing package that lets you cut, paste, copy, transpose, etc.

It's great value at £86.25, but some users – beginners or first-year students perhaps – might not have that sort of money, and might not need the full power of the program that can handle anything up to full orchestral scores.

Makers, Composit Software, have therefore brought out a cut-down version called *MusicPad* for £23. It prints up to 4 staves, copes with any key or time signature, transposes and can include song lyrics.

It's just as easy to use the original, but if you're looking for the ability to produce simple music for your course work, or you want to put down your band's songs on paper, this is an exceptional bargain. Call the good people on the following digits 0952 595436.

CAPITAL CITY

Ever wondered why computer programs (and now drama series) have the obligatory mixed upper and lower case – *LocoScript*, *SuperCalc*, dBase, *EastEnders* etc?

Apparently it's because, traditionally, program variable names cannot have spaces in them – so the capital letters are used to distinguish the words. The classic example is the two variables used in controlling plotters: PenIsUp and PenIsDown.

QUICKIES CORNER

Some quick tips for *LocoScript* users:

1. You can move to a new page with [ALT] [RETURN].
2. When editing long documents (over 10K say) copy them to the M drive first and edit them from there. When you're finished, copy them back to the original drive and group. It's much faster.
3. You can make a document or group have a name with two separate words by using the underline ([SHIFT] hyphen), e.g. NEW_CAR.DOC

Rob Ainsley

MSX

NORTHERN LIGHTNING

A company that trades under the name of Computer Man has been in touch to inform me that it stocks a large range of MSX games at its branch in Shipley, West Yorks.

Not only a selection of tape-based games, the company also has several games on ROM as well as a few second hand MSX 1 computers for sale (Sanyo's I believe).

Altogether Computer Man has four branches in this region of Yorkshire, but at present the company only stocks the MSX range at its ASDA complex, Units 1 to 10, Shipley. By the time you read this article a fifth branch should be open in Skipton, however, and, if there is a demand for MSX software at this branch, it may carry a range of software for our format.

Now there is no need for those in the North of England to moan about lack of support, is there?

NO PLACE LIKE HOMESOFT

In the same week that Computer Man wrote to me, a catalogue of MSX 1 and 2 software arrived courtesy of Homesoft, a Dutch-based software distributor.

The list of titles available in Holland is quite comprehensive, with over 100 budget MSX 1 games, 60 plus full priced MSX 1 games, and 40 plus MSX 2 games.

There are also a few business programs for the MSX 1 and 2 computers, eg *Tasword* on tape or disk, and *Tasword* 2 on disk for the MSX 2. Turbo 5000, the backup cartridge for the MSX 1 and 2 computers, is also still available at approximately £25.

For those lucky enough to own an MSX 2 or 2 Plus computer, *Dynamic Publisher*, the desk top publisher for the MSX 2, is also available for around £50.

As you can see from this small selection from the catalogue, Holland is the place to be for the MSX at the moment. Now the bad news: Homesoft does not supply direct to the end user, but it has promised to put me in touch with a mail order company.

I should, therefore, shortly have the name of a mail order company in Holland, so watch this space for this information. If any retailer would like to contact Homesoft with the view to obtaining software for retail, write to me at the MSX column in *Express*, and I will forward a copy of the list of software.

ALL FORMATS

I visited the All Formats Computer Show in London this week, and, frankly, I was disappointed with the turnout.

The first thing that you noticed on entering the hall was the quiet, with stallholders almost outnumbering visitors. The 'MSX Village' failed to materialise, with only MSX Central, and MSX Link being represented.

In fact, on the Sunday I visited the show, even MSX Link failed to attend, so the poor old MSX user had a very disappointing day of it.

Talking to David Stodell, who was representing MSX Central, I discovered that Saturday was also quiet, although not as bad as the Sunday. What on earth has happened to the computer scene?

Keith Neal

C64

A RATTLING GOOD YARN

Writing a good adventure game is often thought to be similar to writing a good novel. However, there are many things that the adventure author has to consider which would not cause the would-be novelist any sleepless nights.

True, they both have to come up with a string-plot, but there's a lot more to it than that. Does the adventure writer market the game or send it to a publisher? And which publisher? Should a utility be used, or a programming language?

Software protection, data encryption, story-line, screen display, mazes and puzzles, graphics and sound, are all things that the adventure writer must consider. Happily, there is now a book which considers them all for you, and much more besides.

The book is called *Computer Adventures – The Secret Art*, written by adventure author Gil Williamson, and published by Amazon Systems at the price of £7.95. Anything and everything you might possibly want to know about writing adventures seems to be covered by the book, so if you are at all interested in coming up with your own games then track down a copy today.

KING SOLOMON'S MINES

There is an annoying feature in this adventure game for the C64 that you should know about. In part one of the game, do not drink from the canteen, otherwise part two becomes impossible owing to an empty desert which should have something in it.

Never mind, Softgold, better luck to you next time: better luck to arcade players, too.

DIGITAL DYNAMITE

New companies producing software for the Commodore 64 do not spring up every day, so a big welcome to Digital Dynamite.

The company's first release is a collection of four games and a free demo (it says here) for the price of £8.99 on tape or £11.99 on disk. The games cover all areas, from platforms and ladders to adventures and puzzles – and, while the so-called action game *Starburst* is not likely to win any awards this year, I did like the adventure *Citadel Of Corruption*.

The demo, it has to be admitted, is a gem. The price includes p&p, so there are no hidden extras to worry about. For further details or to place an order, write to Digital Dynamite at 54 Watermill Road, Fraserburgh, Grampian AB4 5RJ.

A GOOD, QUICK POKE

I promise to have a fistful of POKEs next time, but for now I have a couple of quickies for you.

On Flying Shark, `POKE 7929,173:SYS 2061` for the cheat mode, and on *Commando*, `POKE 14631,0:SYS 2128` for its cheat mode.

Pete Gerrard

QL

QL ON THE BOX!

Watching the finals of the recent BBC2 design competition, I was intrigued to see what appeared to be a QL on the desk of one of the designers of a nifty pocket microscope.

The outfit responsible is called Science of Cambridge, which was the name of Sir Clive Sinclair's original computer company, which itself developed an odd little system called the MK14 over 10 years ago.

Chris Curry, one of the founders of Acorn, used to run the original Science of Cambridge outfit for the avuncular knight, and he is now a partner in the new venture.

The QL in question had an unfamiliar expansion unit with a circular top plugged into it. According to Tony Tebby of Qjump, this is a mockup of a proposed 0.5Mb wafer-scale memory expansion for the QL.

This product has subsequently been developed into the Anamartic wafer-scale 'silicon disk'.

RFI

RFI is the trade name for Radio Frequency Interference. If you find your QL interferes with radio reception, you could try winding the power supply cable, and the printer cable, through ferrite toroids. This is a technique often used by radio amateurs for reducing RFI from computers.

Suitable toroids (about 4cm across) are available from Tandy stores. Six turns or so should suffice. This tip works with other computers, of course!

Radio amateur Peter Dean (call sign G3FNT) has written a log program using Archive. If anyone is interested, send a cartridge, with return postage and packing, to him at 17 Pineheath Road, High Kelling, Holt, Norfolk NR25 6QF.

Peter would also like to hear from anyone who has information on how to use radio fax with the QL. He has a suitable modem.

John Torofex

SPEAK TO ME!

Some time ago, QUANTA co-founder, Leon Heller, had a phone call from a lady who was looking for a QL speech synthesiser.

Her husband is blind, and such a device would enable him to use his QL more effectively.

If she is reading this column, could she contact Leon on 0424 714790 – he has a possible solution to the problem.

Leon would like to hear from anyone else who is interested in such a device as he has a working prototype, using a Z80 processor and the ubiquitous SPO-256 speech chip.

A speech synthesiser for the QL was advertised by a New Zealand outfit a couple of years ago. Unfortunately, that company no longer appears to be trading, and I don't know of anyone with one of the units.

BBC

HEAD TO HEAD

I have, managed to compare two spreadsheets, *Viewsheet* and *Intersheet*. The results are presented below:

All tests were conducted on a Master 128. The worksheet used contained the formula 22/7 (approx = to PI) replicated from A1 to X58. No attempt was made to optimise for speed.

You can see that, although the two tested differ significantly in some ways, they are both slow at number crunching. In fact, my overall conclusion is that the BBC is not really suitable in its plain form as a spreadsheet tool. Add a co-processor, and the picture does change, but the cost may be prohibitive.

ViewSheet has one factor in its favour though – it's free with every Master sold! On the other hand *Intersheet* does possess some advanced facilities including the ability to link with other applications in the 'Inter' family, such as *InterChart*. Next week, Wordprocessors!

THE RETURN OF ESM

After a long quiet spell, ESM is back with a whole clutch of new releases: *World Map Study*, a graphical world database and *Frieze* and *Kaleidoscope* – both design programs aimed at pupils following the new Maths National Curriculum.

I'll give all three programs a full going over when I get hold of copies, but for now I'll confine myself to saying that, with the advent of the National Curriculum, I believe the Government has done a disservice to all in Education and the software industry in particular.

Andrew Brown

ARCHIMEDES

MULTI-SELECTION

The term 'shift-click' seems to have confused a few readers, (*Express* 83). I'm sorry, I thought it was more generally applicable.

Shift-click is available in all versions of GEM, beloved of Amstrad PC and Atari ST users. It simply means that by holding down [Shift], you can select several files at once with the mouse. On the Arc, of course, the same effect can be achieved using the 'adjust' mouse button, instead of 'select'.

What I'm still no closer to, though, is being able to select a block of files by rubber-banding them. This is a lot quicker than clicking on each in turn, but I don't think it's possible on the Arc. Unless you know better...

DESKTOP GOODIES

A good crop of letters this week, and a couple of readers mentioned the *!StickyBD* utility, which, in addition to letting you paste down a sprite as a desktop backdrop, lets you pop icons directly on the desktop for easy access at any time. It's available in the public domain.

Bob Voisey was one of the people to mention this in a letter, and he also put in a word for his bulletin board, Noah BBS, which includes a news/reviews section on Arc products and over 700 files of PD software.

Bob is Bristol-based and his board is on 0272 572322. He enclosed a very handy disk of 'utilities', mostly amusing like the *Desk Duck*, which swims along the top of the icon bar, quacking as it goes. One of particular interest is the *Squeaky Door*. This utility plays a digitised door squeak whenever you open a filer window. This was one of the other 'want list' items from issue 83.

As other readers have pointed out that the error beep can be fairly easily replaced with a digitised sound using *FX310,20, it seems likely that any interrupt could be intercepted in this way and assigned the appropriate sound. It just wants somebody to tie it all together, grab a good set of sounds and present the whole as a nice RISCOS application for us in the point and click brigade.

Bob also passed on an invitation from Julie Dolling, co-ordinator of the Avon Archimedes User Group. There are around 100 members at the moment, including some top Arc programmers. Meetings are held regularly and a lot of information changes minds at them. Contact Julie on 0454 323081.

I'm particularly interested in hearing from other groups around the country and will post names and contact numbers through the column as I receive them.

PANASONIC PROBLEMS

I would now like to come back to Chris Eason and his problems with a KX-P1081. The problem occurs when printing from *Impression* through the Computer Concepts dongle.

Sometimes the paper-out detector stops the printer printing to the bottom of the page and Chris has to override it by forcing the printer back on-line. At this point, it prints the rogue characters.

CC doesn't believe it's a problem with the dongle, since nobody else has reported it, but it is repeatable with other Arcs and through different cables. It would seem likely from this that it's either a fault in the printer's buffer, exacerbated by the dongle, or a problem with the dongle itself. Perhaps you could try your Arc with another KX-P to confirm this, Chris? A workaround would involve the use of A4 continuous paper. The paper-out sensor would not then trip out at the bottom of a page.

Bertrum Carrot

GAMES ARE IN

A couple of readers moaned that there are too many games reviews in this column and that this is some way 'degrades' the standing of the machine. I can't subscribe to this view, as the Arc, like its predecessor, is intended as an 'all-rounder'. Many of the features that make it so good as an educational, video or sound manipulator are also those which can be stretched by games.

I also believe that a growing games library may lead to a wider buying public for the Arc. At the moment I have sufficient space to mention every program I receive.

If there are more games coming in than other applications, they're the ones that get the coverage.

AMIGA

TAKE YOUR TABLET

Although the Amiga certainly doesn't lack its fair share of graphics tablets, they have never really caught on among Amiga artists. Some credit this to the quality of the Amiga mouse – after all, why buy a graphics tablet when the Amiga mouse is perfectly acceptable for producing art work within packages such as *Deluxe Paint*? Others credit it to a more plausible reason – price.

Until recently, such devices were certainly out of the reach of most Amiga owners – at over £350 for even the cheapest of tablets, it's no wonder they never really caught on. However, all that could change with the announcement by HB Marketing of the-soon-to-be released graphics tablet.

Although no specific details have been disclosed, the company hopes to sell the tablet at around the £150-170 mark, which will certainly make it the cheapest available. The board is being manufactured by SummaGraphics, whose previous tablet sold at a considerably higher price level. For more, give HB a call on 0753 686000.

KEYBOARD CAPERS

Doesn't Commodore's CDTV look like one sexy machine! I for one can't wait to get my hands on the little beauty, and as soon as I can talk those nice people at Commodore into sending me a review model, I'll bring you a full review of Commodore's multi-media baby.

Regular readers of *Express* may remember the picture of the CDTV that was published in *Express* 83. Going back to it, how many of you spotted something strange about the picture? No? Well, if you take another look you'll soon realise that it looks like Commodore has finally resorted to using left-overs and spare parts to build its latest creation. The CDTV keyboard is no other than the old A1000 keyboard, which many users (including myself) came to know and love.

Interestingly enough, this comes only weeks after news that Commodore in the States had changed its policy on A1000 upgrades. For several months now, Commodore has been offering American A1000 users the chance to trade in their old machines for spanking new A2000s (a bit like the A2000/U offer that Commodore UK recently made to UK A500 and A1000 users).

Previously, retailers who supported this offer were allowed to re-sell the old machines. However, all that has now changed, with Commodore requesting retailers to send just the keyboards back, in an attempt to remove the A1000 from circulation. Perhaps the CDTV project could explain where all those A1000 keyboards are actually going!

WORD WORKS

New Horizons' *ProWrite* word processor received critical acclaim when it was released over two years ago. Now, two minor revisions later, New Horizons has taken the product further than ever before with the release of *ProWrite* 3.0.

As well as all the features that made *ProWrite* so popular, this latest release contains many powerful word processing tools previously only found in high-end PC word processors. For starters, the program now supports multiple columns, with a choice of either snaking or parallel text flow.

For those of you who hate having to use the mouse when word processing, all the features of *ProWrite* 3 can be accessed through keyboard shortcuts. You can now cut, copy and paste instantly, without ever having to use your rodent.

Additionally, to stop those errors before they start to mount up, *ProWrite 3*'s 100,000 word spelling checker will check your copy as you type – and the vast 300,000 word thesaurus is on hand if you want to impress your friends with your mastery of English.

To save time, powerful macros can be assigned to function keys, thereby allowing you to carry out long and tedious operations with just a single key press. In time for the impending release of Workbench 2.0, *ProWrite* 3.0 includes full ARexx support, allowing you to control all its functions from either another program or from an ARexx batch file.

Previous versions of *ProWrite* were a little slow in the screen update department, but *ProWrite* 3 is no slouch. New Horizons claims that even the fastest touch typists will find it impossible to out run the program – even if your document contains complex graphics.

No UK details yet, but give New Horizons a bell on 010 512 328 6650.

FANZINE SCENE

Amiga fanzines and disk magazines seem a little thin on the ground, so I thought that it was only fair that I gave my support to what is available.

For PD enthusiasts, George Thomson Services has announced *Public Domain News*. *PD News* is packed with news and tips concerning every aspect of the Amiga PD scene, and it costs just 50p from GTS.

Each of the fanzine's 16 pages are a mass of useful information, all of which is layed out in a clear and highly-readable form. If you're into PD software, then *PD News* is a great way of staying in touch with what's hot and what's not.

The most famous Amiga disk magazine of all must surely be *Newsflash*, which is produced by my old friend Martyn Brown (ex of Seventeen Bit Software). Martyn has courageously battled against all odds to put *Newsflash* where it is today, and he certainly deserves recognition within the Amiga industry for his efforts.

For the latest news, gossip and comment, *Newsflash* is a must. I for one look forward to the arrivial of every new issue. For more details, give GTS a call on 077082 234.

Jason Holborn

MUSIC FOR THE MASSES

We've all played with the endless variations of the now infamous Sound Tracker utility, but none can compare with this latest arrival, Octalyzer – the world's first eight-channel sound tracker utility.

Octalyzer is a sophisticated music composition tool that uses Amiga sound samples as instruments. Using the now familiar Sound Tracker editing system, songs are built up from patterns constructed by placing notes into any of the eight available 'tracks'.

Anyone who has used a Sound Tracker-like program will know how quickly you'll become aquainted with this way of working. Such a system looks initially daunting, but you'll be surprised how quickly you'll be churning out musical masterpieces.

What helps make this latest release far superior to any other sound tracker utility is the inclusion of both a standard file requester (no more pre-set editor – can't be a bad thing) and the use of a small font that allows considerably more music data to be displayed onscreen simultaneously.

Just like Microdeal's Quartet, Octalyzer includes extensive sample editing features. Samples can be cut, pasted, reversed, filtered and generally fiddled around with. Although certainly not the best sample editor in the world, it has the advantage of allowing direct sampling straight into the Octalyzer program – at last you can compose your music and create sampled instruments from within the same program!

Also included is a handy little utility to convert standard 4-channel Sound Tracker song files to work with this new 8-channel variant. Of course the converted files will still only contain 4 channels of music data (what did you expect?), but at least you'll now have the opportunity to 'pad-out' your music scores with extra music data. Contact Crazy Joe's PD on 0709 829286 and ask for disk 259.

SAMPLE EDITOR V1.1
ACTUAL SAMPLE: BUZZ
LENGTH REPSTR REPL
012496 007808 0028
EXIT MARK CUT PASTE CHANGE CHANGE DELTA
SWAP ALL COPY REVERSE VOLUME PERIOD FILTER

• ***If you thought* Sound Tracker *was good, then check out* Octalyser.**

TURRICAN

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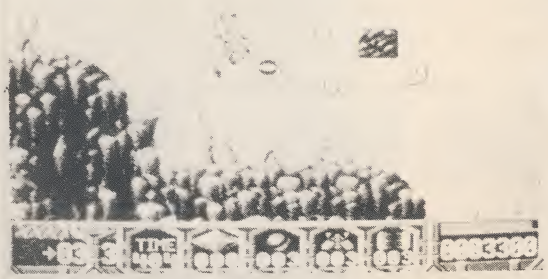

Nightmares are terrible. They make sleep a thing to fear and sometimes leak through to fill people's lives with misery and worry.

The creature responsible for the most terrifying dreams in history was named Morgul. His influence was so severe, that people were too afraid to venture out onto the streets at night, for fear of his demons swooping down.

A heroic warrior named Devolon managed to keep hold of his courage and battle the evil tyrant, banishing him to a far off realm where his influence could no longer command fear in the hearts of men.

There have been a large number of occurrences recently of people once again being gripped by terrible dreams, however. The fact is unavoidable: Morgul plans to return.

You are Turrican – a robotic warrior bristling with so much state-of-the-art military hardware that you are capable of taking on any foe without fear. You must travel to the hidden realm that Morgul has managed to transform into a deadly fortress – inhabited by weak-willed creatures perverted into the ways of evil by the dark lord.

You have a huge array of weapons available to you, from lasers and spray bullets to energy lines and shrapnel grenades. For more difficult situations, there is the flash-gun – which sends out a directable beam of energy that wipes out everything it touches. Your task is to fight through the five areas of the realm until you can find and kill Morgul himself.

Although scrolling shoot-'em-ups appear more frequently than number 37 buses, *Turrican* is definitely one of the best to appear for a while. The action is frantic and exciting, with an incredible feeling of destructive power as you begin to let the weapons fly.

As well as fast-paced, blasting action, there are a few hidden surprises and puzzles to solve, which adds a certain spark missing from other gun-toting romps. Another of *Turrican*'s strengths is the superb, polished coin-op feel that the graphics and sound create, with superbly-detailed sprites and backgrounds being backed by ripping sound effects.

Take a break from shoving money into the slots of arcade machines and have a look at *Turrican*. The difference in the playing isn't too great, but the price of owning the game is: good value, good game.

Maff Evans

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PC

SECURITY AIMS

I'm obviously on PC Security's mailing list. I had an invite to a launch last week, which I couldn't attend. The company has since sent me a folder on the new product – so I feel obliged to give it a mention for the implied hospitality.

The launch covered the CP8 Smart Card reader which you attach to the back of your PC. The cards are issued to your privileged personnel who must then insert them, as with a cash dispenser, to gain access to the machine.

Three questions sprang instantly to mind with this arrangement.

What happens if a Would-Be-Felon (WBF) boots the PC from a floppy? What happens if said WBF cuts the wire connecting the PC to the card reader? And why isn't the reader mounted internally in one of the drive slots?

A quick word with John McIntosh of PC Security (phone 0628 890390) cleared these worries up. Insert a floppy and you have no access to the hard disk at all.

Likewise if you cut the cord or disconnect the card reader, which plugs into the serial port. An internally mounted reader is expected later this year. The box costs £360 and the cards around a tenner each.

HAYES GETS SMARTER

As announced in last week's Express news, page 6, Hayes, manufacturer of the world's most popular modems, has released what it hopes may be the definitive communications software.

Smartcom Exec combines features of earlier software and now includes mouse support, keyboard macros, a 'peruse buffer' (Hayes's words, not mine) and a powerful text editor with word processing capabilities.

A telephone address book is also included, as you might expect, and a scripting language, *Scope*, enables automation of your repetitive comms tasks.

Smartcom Exec will run under *DesqView* and *Windows* and comes in at £79.

THE ZEN OF MASTERMIND

It was good to see a technical writer on the final of BBC's *Mastermind* this week. In among the inevitable civil servants and teachers was a lady who apparently wrote the manuals for Apricot's Zen range of micros.

She answered questions on Mary Wollenscroft, one of the many pioneering women writers and thinkers of the 19th Century and, had the competition not been so intense, may have done better than a very creditable fifth place.

MIND YOUR BATS

Mark Beevers writes to extend a batch file technique mentioned in *Express* 83. Create a couple of mini files first, by doing the following (this assumes you have a sub-directory called \DOS):

```
COPY CON \DOS\CR.DAT [Return]
[Return]
[F6] [Return]
```

and then

```
COPY CON \DOS\DASHES.DAT
[Return]
— [Return]
[F6] [Return]
```

Now add these lines to your AUTOEXEC.BAT file, after any date or time commands that may be needed to set up your system clock:

```
DATE < C:\DOS\CR.DAT | FIND
"C" >> TIMES.DAT
TIME < C:\DOS\CR.DAT | FIND
"C" >> TIMES.DAT
TYPE C:\DOS\DASHES.DAT >>
TIMES.DAT
```

Every time your PC is booted from now on, the time and date will be noted and added to a log file. If your system also uses a program to shutdown your hard disk, you can build in a log-off time as well. This kind of wheeze is particularly useful on office systems.

PROSPERO, I PROSPER

Another issue of the *Prospero* software newsletter arrived this week, which is an interesting event as I know of very few other language companies that bother to inform users of what's going on.

The latest issue details the release of version 5.2 of the PC Pascal compiler which seems to offer lots of interesting goodies, including full level 1 ISO conformance, structured function results, rather than a single passed variable, and short-circuit evaluation of boolean elements.

This last point bears on a rule I've long advocated; If you're making a multiple condition up with an AND function, choose a line of the form IF expression1 THEN IF expression2 THEN... This evaluates much faster than IF expression1 AND expression2. In the first case, a false result to the first expression will prevent the second being evaluated: not so with the second form.

I DON'T HALF PICEM

One of the things I'm trying to do with the *PC Plus Personal Productivity Pack*, which, despite what I said last week, really *should* be out by the time you read this, is to include clip-art in each package.

W've got a good supply of PCX format, mono clips and I have included 10 or so on the first disk set. How much more convenient, though, if I could also display the clips using a utility on the disk.

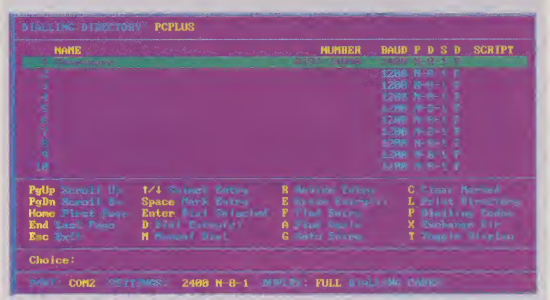
I've been scouting around for a PCX file viewer and have so far drawn a blank. It needs to be quite short (10K – 20K) and to be able to auto-sense the monitor running with it. Anyone know of a likely candidate in the public domain?

While hunting for a program, Mike Williams, a well-known contributor to the *PC Plus SuperDisk*, sent through a copy of *PICEM*. This is a shareware viewer for a variety of filetypes. While not suitable for *P5*, as it's over 40K and doesn't auto-sense, it does handle colour as well as black and white files in several formats – including GIF.

Mike got his copy of *PICEM* from a BBS in the States – called BBB – but it may be available over here, too. Anyway, it's a good excuse for printing the shot of a NASA astronaut which Mike also supplied.

Simon Williams

PROCOMM PLUS DEFEAT



• *Where to ring with PROCOMM*

At a late stage in production of the next *PC Plus SuperDisk*, I discovered that the shortened version of 4DOS, especially prepared by Shareware Marketing, was not the right one. The proper one needed to be transferred to my place of work ASAP.

I don't know whether I've ever explained about my paranoid loathing of comms, but next to it the relationship of the Crusaders and the Turks was positively close.

Nonetheless, I was willing to put a very old version of *Mirror* to the test and dial into Shareware Marketing's bulletin board to try and pull the necessary files off it. After the best part of an hour's hand-holding from SM's technical manager, we'd still only managed to get two of the shorter files across and Steve Lee, SM's boss, reluctantly agreed to courier the files across the following day, with mutterings of 'If he'd had *ProComm Plus*, we'd not have had this trouble'. *ProComm Plus* is SM's preferred comms package.

The following day, Steve's Roller rumbled into our village side street and four hours later we had the disk together and running.

Not to be beaten, Steve also had a go with a copy of *ProComm Plus* on my trusty old PPC 1640 to show what could be done. Half an hour later even Steve had to agree that it wasn't me, it wasn't *Mirror* – though *ProComm* certainly looks a better beast – and it wasn't the PPC. Current theory is the suspicious-looking BT box on the wall. Could this be an amplifier? Could this be a dead amplifier?

RAILROAD TYCOON PC

GAME of the WEEK

Microprose • £34.99

With games like *F-19 Stealth Fighter*, *Red Storm Rising* and *M1 Tank Platoon* on its books, it is not surprising that Microprose has a reputation for glorifying the American war machine.

Those who find this war-mongering objectionable will be pleased to hear that top programmer Sid Meier has come up with a real winner that has nothing to do with war at all.

***Railroad Tycoon* puts you in early 19th century America or Europe with $1 million in your pocket and a landscape of isolated settlements crying out for transport. So you find a couple of cities, not too far apart, build a couple of stations , a train and start shuttling passengers and mail back and forth for a tidy profit.**

Next build a branch line, transporting coal from the hills to the steel mill on the edge of town. Then take the steel on to the factory down the line, and perhaps build another branch to take the factory's output to a harbour on the coast.

Meanwhile, your efforts have inspired the locals to open new industries and, before you know it, you've got your hands full looking after a major network.

Satisfying ever changing supplies and demands is only part of the story – you've got an expanding railway network to manage. Building new lines means finding economic routes, and you've got to make sure your existing stock is being used efficiently.

You've also got to keep an eye on up to three competing railroad tycoons, each capable of taking your custom and even buying into your business.

***Railroad Tycoon* looks stunning too. Trains puff their way through glorious countryside, and there's a full animation whenever a station receives its first delivery or a major train crash happens on the line. A totally absorbing game, although it's a shame there are no facilities for two player games.**

Matt Nicholson

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ST

ART FOR ATARI'S SAKE

Hat Software is in the throes of polishing off *Art Tutor*, a tutorial package that's designed to give you a foundation in the principles of art. Subjects include the human body, (an object most readers should be fairly familiar with) as well as animals, cartoons, plants, landscapes and the use of colours.

Naturally there's a paint package included, one that features the usual stuff: compactor, mirror, brush designer and so on. There are also art picture files you can load into the paint package.

Price has not yet been finalised, though expect Hat's usual keen pricing policy to apply. Call 0743 231763 for more details.

SOUNDS EXCITING

It seems that the ST is beginning to take off in the education field. Rules governing the spending of school funds (such as they are) are changing to allow schools to have a bigger say in where their money goes and, in such an open environment, the ST should do very well.

One subject in which the ST is likely to do particularly well is music, for it has built-in MIDI in and out ports and is the universal choice for the serious muso.

And Impac Resources is gearing up to meet that growth with a series of new packages to encourage the development of musical abilities on the ST.

Tunemaker and *Rhythm Kit* are budget-priced MIDI programs that enable pupils to compose on the ST using traditional music notation. Place the notes, rhythms and words on screen and the ST plays your music through any MIDI instrument, giving a printed copy of the music for your book or folder.

There's also a good quantity of worksheet material to keep you occupied while you wait your turn at the keyboard. (Incidentally, Impac describes these materials as 'photocopiable,' so there's no need for teacher to be seen bending rules to make the goods go round.)

The cost of these programs is hardly prohibitive, with *Rhythm Kit* and *Tunemaker* costing £27.60 and £19.95 respectively – until September that is. Call Impac on 0723 862617 for orders or for further information.

NOTATOR ADD ONS

Still on the subject of ST-based music in schools – many departments have invested in the fabulously capable *C-Lab Notator* sequencing software.

As a follow-up, Impac has now released the *Notator Resource Kit*, a three disk package of examples together with more than 100 pages of exercises and score extracts, student information, teaching strategies – and a section telling you what the program can do.

According to Impac, even the *C-Lab* boffins don't know about everything that's in this package!

Steinberg Pro24, recently relegated to the shadows of the mighty C-Lab, is also well catered for in a separate package. *The Notator* and *Pro24 Resource* packs each cost a very modest £43.12 (blame VAT for the odd pricing), and more details can be obtained by ringing the number provided in the previous section. Tell Impac *Express* sent you.

JUST A MINIX

The MINIX Centre has announced the release of the MINIX multi-tasking operating system that runs on the boring PC, the outrageously expensive Mac – and on the glorious ST. MINIX, as if you didn't already know, started life as an academic teaching aid and is now in worldwide use as a low-cost UNIX look-alike and development system.

MINIX 1.5 contains more than 180 utility commands and both ANSI and POSIX C libraries. It comes supplied with full source code. Interested? You should be talking to the MINIX Centre on 0953 89345.

BUZZBOX 4 – THE REVENGE

The latest version of one of the best ST magazines on disk, *Buzzbox*, is due soon, featuring the usual strong and densely-packed selection of PD and reader contributions.

There's also a questionnaire, in which readers can vote for the best Public Domain library, and the best ST related magazine – a category the editor of *ST Format* will be watching with some considerable interest.

Buzzbox is available for a nominal fee; write for more details to Buzzbox Computing, 5 Balmoral Rd, Moorlands, Lancaster, Lancs LA1 3BT.

SECONDHAND ROLES

What do you do with your software when you've finished with it? Let's face it, if you've played a game all the way through to the surprisingly unexciting final screen, you're never going to load it again.

Teresa Tyler to the rescue. Teresa has had the rather neat idea of starting up a service for buying and selling secondhand games and other software. Send her a list of what you want to get rid of, together with an SAE, and she'll send back a list of what she wants and what she's offering. Sounds good to me.

Write to Teresa Tyler, 105 Burnham Green, Burnham Green, Welwyn, Herts AL6 ONH.

ST TOP TEN (PART 94)

Latest contributions to the ST Top 10 come from Jim George of Aberdeen. (Sorry about the Scotland team by the way, Jim). Jim went for the blanket approach, including a list of 396 songs with the letters 'S' and 'T' in the title. That wasn't exactly what I had in mind!

I did, however, like the inclusion of the Stiff Little Fingers' dittie *Suspect Device* – clearly a description of the Commodore Amiga games machine.

Dave Horton of Haverfordwest put a little more thought into his collection than some others I could mention. *Two out of Three Ain't Bad* by Meatloaf, for example, is clearly the song for the STE games player, and the Madness tune *Embarrassment* could well refer to Atari's feelings surrounding the STE launch.

And how about Wacko Jacko's *Wanna Be Startin' Somethin'*, which is what everyone says after the first three hours sitting in front of the GEM Desktop? Nice one Dave, to whom a highly valuable piece of ST software is even at the moment winging its way.

This month's competition is to come up with an Atari limerick. Keep it clean if you want to see yours published, though, as always, I will be glad to receive any scintillating and imaginative forays of the less decent sort for my own enjoyment.

Address your entry to: There Was A Machine From Atari, Steve Carey, Express, 30 Monmouth St, Bath BA2 2XF.

Steve Carey

SIM CITY

ST GAME of the WEEK

Infogrames • £29.99

It's been picking up awards left, right and centre, and now *Sim City* has finally made it into the ST. This amazingly-addictive game places you in the role of mayor and your job is to build up a city, satisfying the whims of a whingeing public and keeping your finances in check.

As an added headache, you can inflict disasters on the land such as earthquakes or flooding, leaving you with the unenviable task of trying to recover from the disaster. Alternatively, the game comes with eight pre-set scenarios which give you specific objectives – for example, to restore an earthquake-torn San Francisco to prosperity within five years.

The game is played using GEM windows, icons and drop-down menus. You can view the entire map with the cursor keys or the window slider bars. Icons down the left of the screen enable you to select the types of property to position across the map.

At the start of a fresh game you're allocated a budget. With the money you can buy and place residential plots and industrial and commercial zones around the map. Everything must have a power supply, so your first job is to buy a power plant. When these sites have been linked with power, people begin to move in. Road ways are then laid to give the residents easy access to their workplaces.

To encourage people into your city, you need to set low tax rates. Although these don't generate much income, people move in so fast that the city grows rapidly. When enough people have moved in you can bump up the tax rate and reap the cash.

Crime and fire problems can develop, necessitating a police station and fire brigade. These are on-going services which require annual funding. Roads and rail networks also require maintenance fees, and extravagant designs can eat up ridiculous amounts of tax revenue.

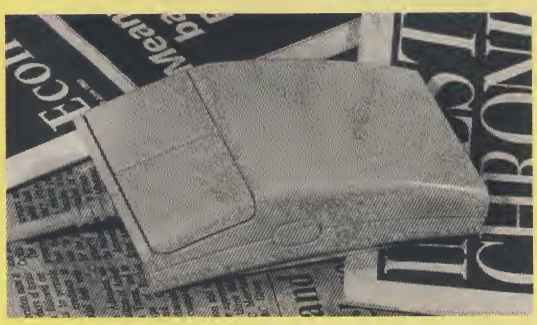
The only major complaint is that *Sim City* has maintained the GEM environment, with all its problems running at speed. Windows appear slowly and mapping out roads and railways can be frustrating and tedious.

If you're not used to playing other formats of the game, then this isn't going to be a problem. You get so involved that you cease to notice faults with GEM after a time. Indeed, *Sim City* gives hours of pleasure as you discover what it is that makes a good city and what makes a bad one. It's frighteningly-addictive and is certain to scale the software charts.

Catch the full 3-page review in this month's *ST Format*.

Mark Higham

CONTRIVER BUS ROUTE



If you have been unable to sleep at nights, worrying that the world has not yet seen a mouse that works across five different computers, fear not, for help is at hand.

Contriver, the aptly-named mouse specialist, has come up with a 'bus' mouse that works quite happily with ST and four other, lesser computers. And at £29.99 it's not a bad price for one with microswitches. Call 0280 822803 if you don't believe me.

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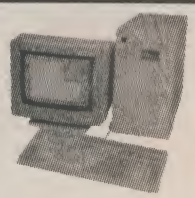

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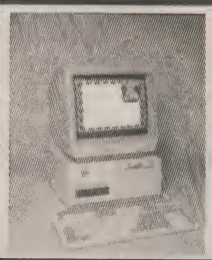
★ Landmark 0.99 speed 117MHz
★ 8Mb RAM (expandable to 16Mb on board)
★ Desktop tower case with one-piece door with 220W PSU
★ 8 Expansion slots (6x16 bit 2x8 bit)
(6 free fully configured 4x16 bit 2x8 bit)
★ 102 key keyboard U.K. Keycaps
★ 1.2Mb 5.25" and 1.44Mb 3.50" Floppies
★ 2 RS-232 Serial Ports (1x9 pin 1x25 pin)
★ 1 IBM Centronics Parallel Port
★ IBM Games Adaptor/Joystick Port
★ IDE Hard Drive Interface/Tape Backup Interface Port
★ Battery Backed Real Time Clock/Calendar
★ 1024x768 SVGA Card 512Kb RAM
★ High Res Mono Monitor
★ DR-DOS Operating System

	VGA P/W	SVGA PW	VGA	SVGA 1024
As Above	£3145	£3245	£3345	£3495
45Mb 25ms*	£3495	£3595	£3695	£3845
100Mb 18ms*	£3695	£3795	£3895	£4045
180Mb 18ms*	£3845	£3945	£4045	£4195
330Mb 18ms	£4445	£4545	£4645	£4795

Options for 486/25:
1Mb RAM Upgrade Modules £85
Mouse w/Driver Software £35

£1095! 25MHz 386

DOLAN 386/25 STANDARD FEATURES



★ 100% IBM Compatible (DOS/Novell/Unix/Xenix/OS-2)
★ 25MHz CPU 80386dx
★ Landmark 0.99 speed 36MHz
★ 1Mb RAM (expandable to 16Mb on board)
★ Small footprint desktop case with 200W PSU
★ 8 Expansion slots (6x16 bit 2x8 bit)
(6 free fully configured 4x16 bit 2x8 bit)
★ 102 key keyboard U.K. Keycaps
★ 1.2Mb 5.25" and 1.44Mb 3.50" Floppies
★ 2 RS-232 Serial Ports (1x9 pin 1x25 pin)
★ 1 IBM Centronics Parallel Port
★ IBM Games Adaptor/Joystick Port
★ IDE Hard Drive Interface/Tape Backup Interface Port
★ Battery Backed Real Time Clock/Calendar
★ 1024x768 SVGA Card 256Kb RAM (expandable to 512Kb)
★ High Res Mono Monitor
★ DR-DOS Operating System

	P/W	SVGA PW	VGA	SVGA 1024
As Above	£1095	£1195	£1295	£1445
45Mb 25ms*	£1445	£1545	£1645	£1795
100Mb 18ms*	£1645	£1745	£1845	£1995
180Mb 18ms*	£1795	£1895	£1995	£2145

Options for 386/25:
1Mb RAM Upgrade Modules £85
Math Co-Processor £350
Mouse w/Driver Software £35

£399! 12MHZ XT

DOLAN XT STANDARD FEATURES

★ 100% IBM Compatible (DOS/Novell)
★ 12MHz CPU V20 (switchable to 4.77MHz)
★ 640Kb RAM (expandable to 1Mb on board)
★ Small footprint desktop case with 200w PSU
★ 8 Expansion slots (5 free fully configured)
★ 102 key keboard U.K. keycaps
★ 360Kb 5.25" Floppy Drive
★ 2 RS-232 Serial Ports (25 pin)
★ 2 IBM Centronics Parallel Ports (VGA 1 only)
★ IBM Games Adaptor/Joystick Port
★ Battery Backed Real Time Clock/Calendar
★ Hercules Graphic Card & High Res Mono Monitor
★ DR-DOS Operating System

	MONO	P/W	EGA	VGA
As Above	£399	£444	£625	£725
40Mb 40ms	£599	£644	£825	£925

Options for XT:
720Kb 3.50" Floppy Drive £65
360Kb 5.25" Floppy Drive £50
640Kb to 1Mb RAM Upgrade £45
Math Co-Processor £135
Mouse w/driver software £35

1 YEAR ON-SITE MAINTENANCE £45
(Any system, any configuration)

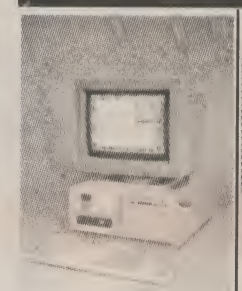
£795! 16MHz 386/SX

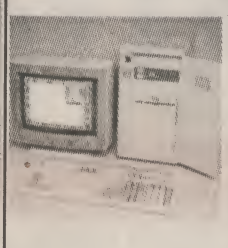
DOLAN SX STANDARD FEATURES

★ 100% IBM Compatible (DOS/Novell/Unix/Xenix/OS-2)
★ 16MHz CPU 80386sx (20MHz optional)
★ Landmark 0.99 speed 20MHz (20MHz version 26MHz)
★ 1Mb RAM (expandable to 8Mb on board)
★ Small footprint desktop case with 200W PSU
★ 8 Expansion Slots (6x16 bit 2x8 bit)
(6 free fully configured 4x16 bit 2x8 bit)
★ 102 key keboard U.K. keycaps
★ 1.2Mb 5.25" and 1.44Mb 3.50" Floppies
★ 2 RS-232 Serial Ports (1x9 pin 1x25 pin)
★ 1 IBM Centronics Parallel Port
★ IBM Games Adaptor/Joystick Port
★ IDE Hard Drive Interface/Tape Backup Interface Port
★ Battery Backed Real Time Clock/Calendar
★ 1024x768 SVGA Card 256Kb RAM (expandable to 512Kb)
★ High Res Mono Monitor
★ DR-DOS Operating System

	P/W	SVGA PW	VGA	SVGA 1024
As Above	£795	£895	£995	£1145
45Mb 25ms*	£1145	£1245	£1345	£1495
100Mb 18ms*	£1345	£1445	£1545	£1695
180Mb 18ms*	£1495	£1595	£1695	£1845

Options for 386/SX:
20MHz CPU Upgrade £75
1Mb RAM Upgrade Modules £85
Math Co-Processor £250
Mouse w/Driver Software £35





£1845! 33MHz 386

DOLAN 386/33 STANDARD FEATURES

★ 100% IBM Compatible (DOS/Novell/Unix/Xenix/OS-2)
★ 33MHz CPU 80386dx with 32Kb on-board Cache
★ Landmark 0.99 speed 58MHz
★ 4Mb RAM (expandable to 16Mb on board)
★ Desktop tower case with one-piece door with 220W PSU
★ 7 Expansion Slots (5x16 bit 2x8 bit)
(5 free fully configured 3x16 bit 2x8 bit)
★ 102 key keboard U.K. keycaps
★ 1.2Mb 5.25" and 1.44Mb 3.50" Floppies
★ 2 RS-232 Serial Ports (1x9 pin 1x25 pin)
★ 1 IBM Centronics Parallel Port
★ IBM Games Adaptor/Joystick Port
★ IDE Hard Drive Interface/Tape Backup Interface Port
★ Battery Backed Real Time Clock/Calendar
★ 1024x768 SVGA Card 512Kb RAM
★ High Res Mono Monitor
★ DR-DOS Operating System

	VGA P/W	SVGA PW	VGA	SVGA 1024
As Above	£1845	£1945	£1995	£2145
45Mb 25ms*	£2195	£2295	£2345	£2495
100Mb 18ms*	£2395	£2495	£2545	£2695
180Mb 18ms*	£2545	£2645	£2695	£2845
330MB 18MS	£3145	£3245	£3295	£3445

Options for 386/33:
1Mb RAM Upgrade Modules £85
Math Co-Processor £450
Mouse w/Driver Software £35

SALES HOTLINES 0267 234444

Dedicated to bringing you a reliable product at a realistic price, **DOLAN** leave the wild claims & hidden extras to our competitors. A quick check of our specifications will **PROVE DOLAN** is **THE** cost effective solution. Accordingly, when a leading magazine surveyed fifty of the best selling P.C.'s **DOLAN** were the only systems to be rated 5 stars.
(A list of the "Also Rans" is available upon request).

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THE SHOPPING EXPRESS BUYER'S GUIDE TO

PC ESSENTIALS

WORD PROCESSORS • SPREADSHEETS • ACCOUNTING • DATABASES • DESKTOP PUBLISHING •LANGUAGES • GAMIES

There's probably more software for the PC than for all other machines put together, so a comprehensive list is clearly impossible. Choosing 'the best' fifty programs is impossible too – it depends on what you want your PC to do. But here's the *Express* list of the 50 programs we think should be at the top of your shopping list. Word processors, home accounts, spreadsheets, programming utilities... the list goes on and on. We've cut down our categories to include software that you can't afford to be without, at home or at work; the essential PC software.

We give what we consider to be the all-round best program or programs in each section, together with a brief description of each, and a few highlights and drawbacks. There's also the availability details, though as ever, check the mail order ads in Shopping Express first. You're sure to find some excellent discounts available.

WORD PROCESSORS

● PROTEXT V4

£100 • Arnor • 0733 68909

For sheer text and file handling *Protext* stands out. It's fast, flexible and full of features; good spell checker and mail merge facilities so powerful you can write program-like text and file handling routines. For writers and journos this is a must.

▲ Fast
▲ Spell checker
▲ Powerful mail merger
▲ Powerful macros
▲ Loads of extras – calculator, word counter etc
▲ Two file editing

▼ No real graphics capability
▼ Not good at handling complex layouts

VALUE FOR MONEY ★★★★★

● TASWORD

£50 • Tasman Software • 0532 438301

Superb value and fast. A few odd limitations but an excellent basic word processor. *TasSpell*, the spell checker, also available, along with *TasRes*, the memory resident version of the processor.

▲ Memory resident and fast
▲ Easy to customise
▲ DOS shell macros
▲ Word count, notepad features etc

▼ Clumsy text insertion
▼ Some limitations – find and replace won't accept spaces, blocks must be whole lines etc

VALUE FOR MONEY ★★★★★

● CELEBRITY

£80 • Software Paradise • 0222 887521

A well designed word processor with a lot of extras and plenty of appeal for the first time user. It doesn't show the compromises usual with beginner's packages.

▲ Good clear command structure
▲ Calculator, calendar, DOS manager etc
▲ Thesaurus and spell checker
▲ Up to four text windows

▼ Thesaurus US and a bit slow
▼ Window dimensions fixed

VALUE FOR MONEY ★★★★

● MULTIWRITER 2

£115 • NewStar Software • 0245 265017

A very powerful package that includes many features usually found only on really expensive word processors. *WordStar* dot commands can be included directly in a document so this may be ideal for *WordStar* diehards. Lots of extras – author's utilities and a filing program, for example.

▲ *WordStar* compatible
▲ Good menu and context sensitive help
▲ Extras: contents and index generator etc
▲ Filer utility

▼ Filer awkward to use

VALUE FOR MONEY ★★★★

● BORLAND SPRINT

£199.95 • Borland • 0734 320022

A hugely powerful word processor – certainly worth looking at if you need the complete works. Breathtakingly fast with an auto-save feature that means even if the power goes your document has been saved exactly as it was at that moment. Comes with front ends that make it look like *WordStar*, *WordPerfect*, *MultiMate* or Microsoft *Word* if you're used to those packages. A bit complicated to use though and modelled on C, which doesn't help.

▲ User interfaces for *WordStar* etc
▲ Thesaurus and check-as-you-type spell checker
▲ Cross-referencing
▲ Very powerful indexing facilities
▲ Laser and PostScript support

▼ Very complex to use – only get it if you really need all the power
▼ Still a few little bugettes

VALUE FOR MONEY ★★★★★

● MICROSOFT WORD

£395 • Microsoft • 0734 500741

Another of the heavyweights. Packed with every feature you can imagine, but you're paying for it. Easy and intuitive to use for such a high-powered package – ideas outliners, contents/ indexing and footnotes, very good graphics facilities – and it runs under windows and OS/2.

▲ All the heavyweight features:thesaurus, spell checker, author utilities
▲ Ideas outliner
▲ Good graphics import facilities
▲ Runs with windows and OS/2
▲ Easy to use

▼ Very pricey
▼ Need a powerful machine – slow unless you have a 286 or 386

● WORD PERFECT

£250 • Sentinel • 0932 231164

Supposedly the biggest selling word processor on the PCs. A huge program with everything you could ever need: thesaurus, spell checker, two column text, footnote and index generation, automatic date insertion, end notes, mathematical symbols etc etc etc. Frankly though a disappointment for the huge price; only any use if you're already committed to the program because of training – or if you can get it on expenses.

▲ Everything you could ever need in a word processor
▲ Exemplary manual
▲ Available on minis, mainframes as well as micros

▼ Vastly expensive
▼ Some very complex keystrokes for functions – must be learned by rote

VALUE FOR MONEY ★★★

● CHIWRITER

£92 • Shareware Marketing • 0297 24088

The word processor for scientists. Originally a shareware product, this word processor lets you design and use predesigned fonts for scientific use. Can cope with any mathematical symbols – even the most complex integrals for example. The most impressive WYSIWYG you'll ever see! Might be worth hanging on a couple of months for the PC version of *LocoScript* though, which will no doubt outperform *Chiwriter* for less money.

▲ Handles any maths – integrals, complex set theory symbols etc
▲ Does foreign characters too
▲ Footnotes and font designer

▼ Limited as a word processor: no mail merge, word count only after spell check
▼ Only one document at once
▼ Hidden extra costs for hi-res or screen

VALUE FOR MONEY ★★★

● TOPCOPY PLUS

£109 • Innova Software • 0453 835379

Big brother of *Topcopy* – a very powerful and well-featured word processor. Verging on the 'big league'. Very fast – memory resident – and keeps everything reformatted as you go. Multi document handling together with the speed of operation makes it ideal for people who shunt text around a lot. good spell check and mail merge too.

▲ Memory resident
▲ Can import text from defined areas of underlying screens

➤

DATAPLEX

VISA

129 Bath Road,
Slough Berkshire,
SL1 3UW
Tel: 0753 35557

19 High Street
Swindon, Wiltshire
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Showroom open:
Monday - Friday 9.30 - 5.30 Saturday 9.30 - 4.30
All prices excluding VAT and delivery

AMIGA HARDWARE

Amiga 500 + Batman Pack & 5 games, joystick £345.00
New Amiga Flight of Fantasy Pack - £317.00

AMIGA BATMAN PACK £317

New from Amiga
Includes: TV modulator, 3.5" Disk Drive with Amiga DOS Kickstart, Workbench and Batman The Movie game, F18 Inceptor, Paint 2, New Zealand Story.

AMIGA ACCESSORIES

Inc. database, spreadsheet, WP, music, art & design, logo and BBC emulator.

Amiga Class of the 90's.....£439

Amiga A501 RAM pack + Clock (original).....£85
Amiga joystick £10
TV Modulator.....£15
Phillips CM8833 colour monitor + lead £199
Phillips BM7502 12" green monitor.....£79
Phillips BM7522 12" amber monitor.....£89
Amiga To Philips cable.....£8

AMIGA DRIVE

1 Meg 3.5" external.....£68
1 Meg 3.5" internal £63
1 Meg 5.25" external.....£99

ATARI DRIVES

1 Meg 3.5 external.....£68
1 Meg 5.25 external £99
1 Meg 3.5 internal £63

ATARI COMPUTERS

520 STFM Discovery Pack.....£248
520 STE Power Pack.....£325
1040 STE.....£378

SCANNERS

Atari Scanner.....£169
Amiga Scanner £169

MOUSE

Naksha mouse.....£29

STAR PRINTERS

Star LC10 mono.....£135
Star LC10 II mono £159
Star LC10 colour.....£168
Star LC2410 + lead + stand £215
Star LC15 9 Pin 136 column.....£264
Star LC2415 24 Pin £328

PANASONIC

Unbeatable Prices!

Panasonic 1081 .....£125
KXP 1124 + lead + stand £215
KXP 1624/132 column, 24 Pin £249
KXP 1180 .....£144

CITIZEN PRINTERS

Citizen 120D.....£120
Citizen 180E.....£127
Swift 24 .....£255
Colour upgrade for Swift £42

MANNESMAN TALLY

Mannesman MT 81 Dot Matrix.....£115
Mannesman Sheetfeeder.....£62
Mannesman Serial Interface £49

REPAIRS FOR AMIGA AND ATARI

▲ Auto reformats but still fast
▲ Three files on screen at once, handles up to six documents
▲ Spell checker and mail merge
▲ Very fast

▼ One or two useful commands missed (eg. swop letters)
▼ No auto backup of files

VALUE FOR MONEY ★★★★

● GALAXY

Shareware • Advantage/PDSL • 0242 224340/ 0892 663298

One of many shareware word processors that resembles *WordStar*.

Doesn't compete with ones you pay a hundred quid for, but for the price you get a usable program ideal for occasional use.

▲ Menus
▲ Spell checker
▲ Bargain price

▼ Restricted power – best for occasional user

SPREADSHEETS

Probably one of the primary uses for PCs, the spreadsheet is the staple of the small business user and some of the best around are available for the PC.

●VP PLANNER PLUS

£172 • Paperback Software • 0245 265017

Fully featured, Lotus *1-2-3* compatible spreadsheet generally held to be the ultimate in PC spreadsheet programs. There's support for a mouse as well as multi-dimensional financial modelling.

▲ Comprehensive
▲ Complex modelling can be achieved
▲ Reasonably priced (there's a cut-down £115 version too)

▼ Difficult to learn
▼ Hard drive and printer required

● LUCID 3-D

£91 • PCSG Inc./Software Paradise • 0222 887521

Cheap spreadsheet from PCSG lacking graphics but with the ability to perform most of the necessary functions.

There's absolutely no 'minimum hardware' requirement and it's cheap. Also this program has the advantage of featuring 3-dimensional linking of cells from different spreadsheets.

▲ Cheap
▲ Linking of separate spreadsheets
▲ No minimum hardware requirement

▼ No graphics

● THE TWIN

£67 • Mosaic Software • 0604 830496

Cheap 'n' cheerful spreadsheet that is the younger sibling of the outrageously named Legend: Twin Level III. The Twin is an almost exact copy of Lotus *1-2-3* at a fraction of the cost of that eponymous program. Well worth 67 quid.

▲ Cheap
▲ All of the features of Lotus *1-2-3*
▲ Powerful graphics

● LEGEND: TWIN LEVEL III

£207 • Mosaic Software • 0604 830496

The spreadsheet that sounds like an adventure game. Burrow deep into the powerful Lotus 123-like features such as 3-dimensional cell linking, graphics and database functions.

▲ 123 features provided
▲ 3-D cell linking
▲ Powerful

▼ Not for the spreadsheet novice

● PC-CALC PLUS

£57 • Shareware Marketing • 0297 24088

Cheap basic shareware spreadsheet that is nonetheless good quality. All necessary spreadsheet functions implemented. You can get a version of this spreadsheet complete with – cut-down – manual for five quid from PC user groups. Full documentation will require registration with Shareware Marketing and the handing over of the full price.

▲ Cheap, cheap, cheap
▲ Easy to learn
▲ Available from user groups

▼ Basic

DATABASES

Everyone needs a database. From business use such as motor car parts, baked beans stocks and can opener suppliers to home uses such as stamp and record collections and train number cataloguing.

● DBASE IV

£595 • Ashton-Tate • 01-5699768

The database that's got it all. Spawned a huge range of clones for many other machines. Complex and all reaching, dBase is a database-specific programming language that allows you to build filing programs tailor-made.

▲ Complex
▲ Can be tailored to suit individual needs
▲ Industry standard

▼ Expensive
▼ Not for beginners

● DBXL 1.2 DIAMOND RELEASE

£115 • Software Paradise • 0222 887521

dBase clone featuring all the abilities of the original with a better text editor, variable arrays and user defined functions at an affordable price.

▲ Cheap
▲ Very powerful

▼ Difficult to master
▼ Not for beginners

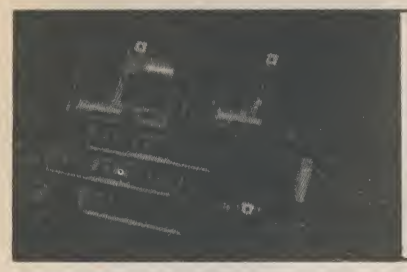
● TAS PLUS

£120.75 • Megatech • 01-874 6511

Powerful database that allows you to spread a database over many files. It's programmable, relatively easy to use and cheap.

▲ Fully featured
▲ Easy to use
▲ Cheap

➤



MEMORY UPGRADES

ONE STOP SOURCE FOR ALL PC MEMORY UPGRADES

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COMMITTED TO MEMORY

UK exclusive distributor

Kingston TECHNOLOGY

The market's first choice and leader in plug compatible memory. 5 year warranty, large UK inventory, UK technical support and 24 hour replacement policy.

1 CHIP UPGRADES

Chip and Memory Module upgrades to suit all microcomputers including: APPLE, AST, AMSTRAD, COMPAQ, COMMODORE, DELL, DEC, EPSON, EVEREX, HEWLETT PACKARD, IBM XT/AT, IBM PS/2, INTEL, MITEC, OLIVETTI, TANDY, TI, TOSHIBA, TULIP, SUN, Plus many more.

Call our unique free advisory service for any memory upgrade assistance.

Chip Support includes:

	(£)		(£)
64K x 1 – 120	1.25	1M x 1 – 100	6.25
64K x 4 – 100	1.85	1M x 1 – 80	6.65
64K x 4 – 80	2.45	1M x 1 – 70	6.95
256K x 1 – 120	1.75	256K x 4 – 80	6.65
256K x 1 – 100	1.85	4M x 1 – 80	Call
256K x 1 – 80	2.45		

Call Sales Office for details on full range including: SRAMS, EPROMs, EEPROMs, MEMORY CARDS, and custom requirements.

2 SIMMS & SIPS

Over 80 different types of stock:
Popular options include:

	(£)
256K x 8 – 120	19
256K x 9 – 100	23
256K x 9 – 80	26
1M x 8 – 80	64
1M x 9 – 100	68
1M x 9 – 80	71
1M x 9 – 70	82
4M x 9 – 80	Call

Call for SIP Pricing.
81MM upgrade available for ORCHID, EVEREX, TECMAR, AST CD, INTEL Above Boards.

3 CO-PROCESSORS

		(£)
8087 – 1	10 MHz	115
8087 – 2	8 MHz	95
80287 – 6	6 MHz	98
80287 – 8	8 MHz	150
80287 – 10	10 MHz	175
80387 – 16	16 MHz	260
80387 – 16SX	16 MHz	235
80387 – 20	20 MHz	295
80387 – 25	25 MHz	370
80387 – 33	33 MHz	395

4 IBM XT/AT MEMORY

		(£)
128KB	Plug in Module	88
512KB	· Orchid	265
1MB	EMS Boards.	299
2MB	· User	345
4MB	upgradeable	495
8MB	to 8MB.	790

5 EVEREX MEMORY

Complete family available. Popular configurations include:	(£)
RAM 10000 (with 2MB)	325
RAM 3000 Deluxe (with 1MB)	195
MiniMagic Card (with 128KB)	80
MaxiMagic Card (with 2MB)	240

6 IBM PS/2 MEMORY

Planar Memory. Plugs directly onto system board. For assistance in selecting correct upgrade path call Sales Office.

		(£)
PS/2 25	128KB	34
PS/2 30/286	512KB	76
	2MB	210
PS/2 50Z & 55	512KB	76
	2MB	210
PS/2 70	1MB	135
	2MB	215
PS/2 80	1MB	175
	2MB	295

7 TOSHIBA MEMORY

	(£)
Portable T1600 2MB Card	344.00
Portable T3100e	
512K card 148.00 2MB card	344.00
Portable T3200 3MB card	485.00
Portable T5100 3MB card	344.00
Portable T5200 2MB Module	344.00
Portable T3100 SX 2MB card	344.00
Portable T3200 SX 2MB card	344.00
Desktop T8500 SX 2MB card	344.00

8 APPLE/MACINTOSH MEMORY

Standard SIMM upgrades for: Macintosh II, IIcx, IIx and IIci available (C.S.O.) Special Modules include:

	(£)
MAC IIci	
16MB Memory Kit	1589
MAC IIfx	
4MB Memory Kit	390
PORTABLE	
1MB Upgrade	323
4MB Upgrade	£Call
LASERWRITER II/NTX	
1MB Expansion Kit	145
4MB Expansion Kit	359

9 HP LASERJET MEMORY

	(£)		(£)
LASERJET II & IID			
1MB	155	4MB	365
2MB	235		
LASERJET IIP & III			
1MB	175	3MB	305
2MB	250	4MB	370

Cannon and IBM Laserjet upgrades also available (CSO).

10 IBM PS/2 ADAPTOR BOARDS

EMS Board that accepts special IBM Planar Simms (See Section 6).

	(£)
PS/2 50, 507, 557, SX & 60	
2 – 8MB Expansion Boards	445
PS/2 70 & 80	
2 – 8MB Expansion Boards	450

11 COMPAQ MEMORY

Full range available to suit Portables II, III, 386, SLT and LTE and all DESK Pro Series 286e to 386/33.

	(£)
DESKPRO 386/33	
2MB Module	28
DESKPRO 386/20/25/e/s	
1MB Add-on Module	135
4MB Add-on Module	455
1MB Expansion Board	170
4MB Expansion Board	495
DESKPRO 386/16	
1MB Kit	235
4MB Kit	785
1MB Expansion Board	270
4MB Expansion Board	985
PORTABLE II & III	
512KB for III	69
1MB for II	89
2MB for III	179
COMPAQ SLT/286	
1MB Board	225
COMPAQ LTE/286	
512KB Board	175
1MB Board	225
2MB Board	325
COMPAQ SYSTEMPRO & 486/25	
2MB Module (New)	285
8MB Module	1745

12 HP FONT CARTRIDGES

100% Compatable HP Font cartridge series.

STANDARD CARTRIDGES	(£)
86/A,C,D,E,G,H	43.00
86/B,F,J to Q,S, to Y	59.00
86/R and Z	69.00
65 IN 1 CARTRIDGE	
Equivalent to HP Pro Collection. UK version includes Line Draw and OCR-A.	135.00
MASTER TYPE CARTRIDGES (New)	
Equiv. to HP C2053 AC01 to C02	(CSO)

13 EXTERNAL FLOPPY DISC DRIVES

	(£)
IBM PC/XT	
3.5 Inch 720KB	85
5.25 Inch 360KB	85
IBM AT	
3.5 Inch 1.44MB	97
5.25 Inch 1.2MB	97
IBM PS/2	
5.25 Inch 360KB	105
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▲ Comprehensive
▲ Easy to use
▲ Moderately priced

▼ Setting up may confuse absolute beginners

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£25 • EQ Consultants • 0334 84248

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▲ Amazingly cheap
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▲ Easy to use

● CALLBOX

£171.35 • Callbox Ltd • 0600 4478

A program which takes control of your telephone allowing you to perform all manner of snazzy dialing functions, number recalls, auto calls etc. All this for only one hundred and seventy one pounds, wow!

▲ Cheaper than equivalent hardware (i.e. telephone)

▼ Breath-takingly expensive
▼ Only for those without the energy to dial a number

● LINK MASTER

£19.95 • Amstrad Software • 0277 230222

Billed as the 'complete kit for file transfer between two PCs' thereby implying a hard/software cast of thousands, Link Master is a cable and bit of software for £20 that allows you to transfer files between two PCs. Why not just use floppy disks? Or, perhaps that would be asking just a little too much (perhaps it wouldn't)

▲ Cheap
▲ Easy to use

▼ Superfluous
▼ Unnecessary (unless you have machines with wildly differing drive formats

● PROCOMM PLUS

£59 • Shareware Marketing • 0297 24088

Fully-featured general purpose communications program for use with modems. The program supports the industry-standard Hayes command language and seven file transfer protocols. There's an earlier version known as Procomm which can be had from the same supplier for a few quid.

▲ Reasonably cheap 'n' cheerful
▲ Hayes compatible
▲ Plenty of file transfer options

ACCOUNTING

The serious side of the PC. And let's face it, if you've spent the enormous sums necessary to buy the computer system, your going to need to save money somewhere.

● MICROSYSTEMS

£454 • Multisoft • 0420 85572

Very powerful accounting package emanating from well-known accounts software writers Multisoft. Menu driven programs ensure ease of use and give access to virtually every possible accounts function necessary. There's some extremely good help screens too in case you should encounter difficulties.

▲ Menu driven
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▼ Too expensive for the home or small business user

● A-B-C

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Quality accounting package that has the distinction of sporting a word processor, database and spreadsheet as well as the accounting module. All the features of a professional accounts application are built into A-B-C as well as good after sales service and help.

▲ Built-in word processor, spreadsheet and database
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▲ Can be used on single disk systems

▼ A little expensive for home users

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£50 • Buzzz Software • 0865 56083

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▲ **Very cheap**
▲ **Powerful**

▼ **Not for beginners**

● QUICKBASIC

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▼ **A little overpriced**

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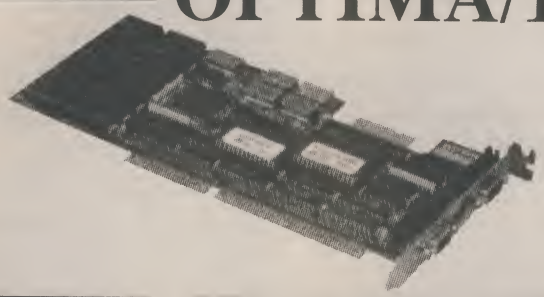

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▲ Wonderful graphics
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▼ VGA necessary for best display
▼ Expensive

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▲ Super graphics
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▲ Lots of places to fly around, through, up and over.

▼ Expensive

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▲ Wonderful graphics
▲ Fast

▼ Expensive (the eternal PC games criticism)

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▲ Complex
▲ Good graphics

▼ Expensive
▼ A little boring in the early stages

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Perhaps the most outstanding feature of the 1040 STE is its graphics. Its palette contains over 4000 colours (all right, 4096 to be exact).

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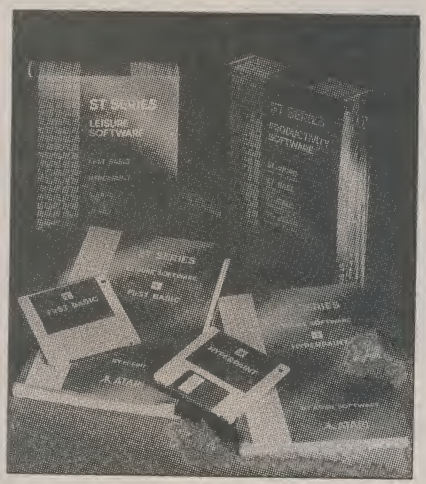

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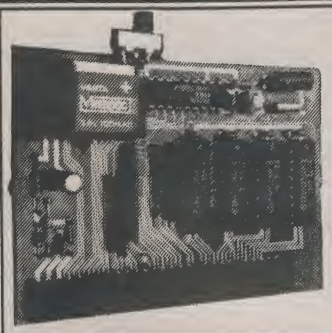

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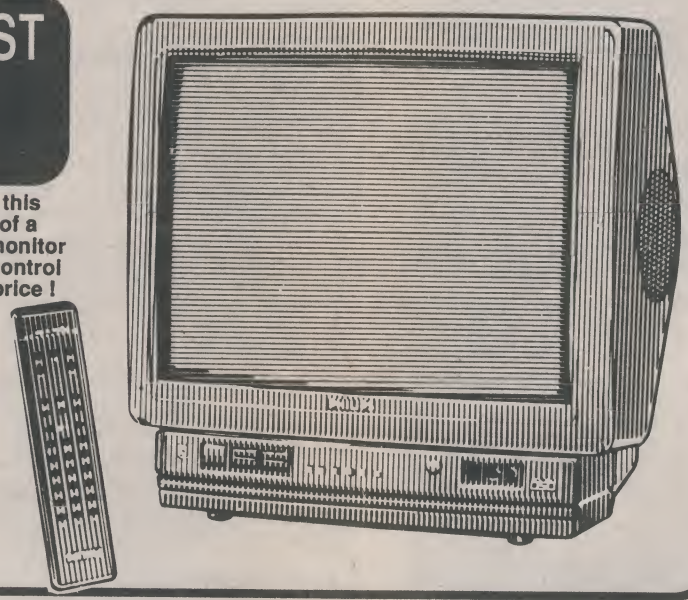

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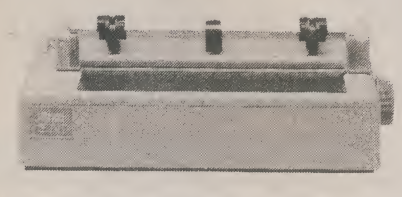

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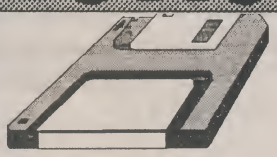

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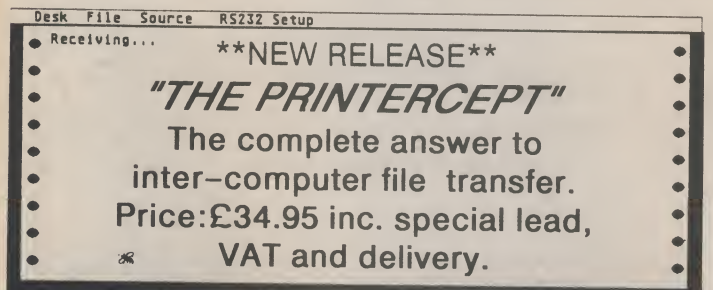

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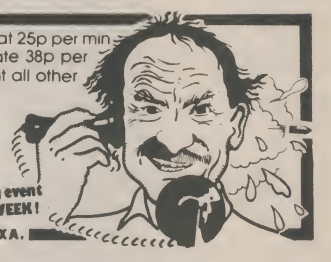

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THE PD COLUMN

There is a lot of software out there available for the price of a disk. This week Adam Waring looks at some of the demos for the Atari ST and the CPC, and he instructs you on where to go for the best of the lot.

There are many different types of program available in the public domain. Some are more useful than others. They range from full implementations of sophisticated languages, to simple routines that speed your mouse up.

The most useless of all, though, are demos. They don't serve any real purpose. Very few have any kind of human interaction at all. The only thing you can do is sit tight and look at them.

Yet demos still come by the bucketload. Enthusiastic collectors have hundreds tucked away in their disk boxes. PD libraries have tons of them listed in their books. Why then is there so much interest in what is such an apparently useless product?

Well, it's because demos are visual extravagnzas. They are normally extremely well written programs, and can be a pleasure to watch. The programmers try and squeeze in as much impressive coding as they can, battling against memory restrictions and processor time – but most of all, battling against the writers of other demos. The competition is very fierce, and there's an awful lot of one-upmanship in the world of demo-writing.

ATARI ST

There are plenty of demos around for Atari's baby. They range from the run of the mill scrolly messages that you've seen a million times before, to some rather more interesting and unusual examples.

It's all very well, these demos running at lightning speed, pushing state-of-the-art 68000 programming to its limits. But it's a feat everyone could accomplish. The thing is, a demo written in BASIC just wouldn't be a scratch compared to the coded equivalents, would it now? Not true!

Demo City proudly presents *The Ultimate GFA* demo. As the name suggests, it is written entirely in GFA basic, but it is every bit as impressive as those 100 per cent machine code spectacles.

There are around 12 demos on the disk. Admittedly, some are of a better quality than others – some are definitely very impressive indeed.

One of the best is the *Who Dares* demo. This one is very similar to a machine code demo that was doing the rounds a while ago. It has the mandatory bouncy scrolling message, parallax backgrounds, a stunning sound track and much more besides.

There are some really sick people out there. I mean, a demo that does nothing but animate some poor souls head exploding? Surely no-one's interested in that sort of thing...

Oh, you are. Well in that case the *Scanners* demo from The Other PD Library may be of interest. It's based on the enjoyable psychic splatter movie of the same name.

The demo displays a sequence of digitised stills from the film. More specifically, it's that particularly gruesome scene where the TV presenter loses his head. It is beautifully animated, showing everything in gory detail.

On a similar theme, ie films, I came across a demo that attempts to tell the story of *Predator*. A combination of stills from the film, animated sequences, digitised sounds and computer graphics, tied together with a little clever programming produce a very atmospheric show indeed.

Obviously you can't glean total understanding of the plot from this three minute demo – so it's no substitute to

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hiring the video. In fact, *Predator* the demo probably won't make an awful lot of sense to those who haven't yet seen the film.

Predator comes once again from Demo City. This library is purely devoted to demos, and their shelves are well stocked, with almost 150 of the things. Another library bulging at the seams demo-wise is Sphinx Software.

This company has millibongs of them, a fair percentage of which arrived on my desk, and the combined weight of which threatened to return the poor piece of furniture to its pre-assembled, flat-pak state.

The Swedish Demo looked like it might be, 'erm, interesting. No such luck though, not a Swede in sight. I couldn't find vegetables of any description. This demo has been put together by scandinavian programmers.

These industrious Swedes do their level best to make their messages impossible to read. Not because of the language barrier though – no it all makes perfect sense in English.

The problem is in the way the letters twist and turn in the most alarming fashion. There are six demos in all. They tend to follow the same old format, but that said, they really take your breath away when you run them. These are well worth the look, and you won't be disappointed.

CPC

So is it only the 16-bit machines that are capable of such spectacular, but superfluous software? Until recently you'd have thought so, but that was before seeing the latest offerings from Robot PD. Robot has got its hands on a couple of rather nifty French demos.

The *Spy Hunter* demo from the Bitmasters starts the ball rolling, with the usual complement of scrolling, flashy effects in the border and so on. It'd be reasonably impressive on a 16-bit, so it's pretty good stuff for your CPC.

It pales into comparison next to the *Malibu Demo*, though. *Malibu* starts off well enough, with a scrolly message at the bottom and a big bouncing logo at the top. Then there's a quick burst of synthesized speech.

It's in French unfortunately, so I haven't any idea of what it actually says – I just hope it's not obscene. Things improve enormously from then on. The music is nothing short of brilliant, it must be pushing the CPC's sound chip to its limits, and as the letters scroll across they split up. All in all, it's clever stuff.

That said, there is plenty of room for improvement for this type of program in the CPC scene. Hopefully, more programmers will be encouraged by the French efforts, and we'll be seeing some real class on what, after all, is the best of the 8-bit machines. (Corks, that's a bit of a sweeping statement, eh readers?)

DEMO HISTORY

The history of the demo goes way back. The first were probably those produced as rolling displays for shop windows. They were like electronic adverts, persuading the punter that the Commodore Pet really was the machine they needed more than anything else.

They highlighted the features of the machine, and while they weren't particulally amazing, compared to today's hottest stuff, they probably sold at least as many computers as their human counterparts, the salesman.

Hacking into games to make them easier to copy cannot be condoned, but it's an important factor in this history lesson. It's where demos really took off, on the sixteen bit machines especially.

It became a tradition to leave a crackers message stating which team was responsible for bringing you the game. Pseudonyms where of course used, only a complete fool would have left their real identity for all to see.

These messages became more and more prominent, until eventually there was more programing skill going into the animated scrolling displays than some of the games themselves. People were getting hold of the latest cracked software, not for the program, but to see how good the hackers demo was.

Hence the demo we know and love was born. Many of the cracking groups stopped bothering to crack the games, and devoted their energies to writing more and more intricate demos instead .

There are of course, mixed reactions to demos. Some people find them incredibly tedious, while others cherish each and every one. At any rate, demos are getting better – so investigate.

WHERE TO GO

• Demo City, 15 The Wind, Dunshalt, Cupar, Fife KY14 7HE. Phone 0337 28159. If it's demos you're after, and you have an ST, Demo City has plenty. Prices are £2.50 per disk, reduced to £2 when you order ten or more.

• The Other PD Library, 108 Kenmere Road, Wavertree, Liverpool, L15 3HQ. Phone 051-734 4465. Another ST-only library. Disks from £2.50.

• Sphinx Software, Erw Fynnydd, Carmel, Llanelli, Dyfed. SA14 7SG. Tons of ST software, including lots of demos.

• Robot PD, 2 Trent Road, Oakham, Rutland. LE14 6HF.

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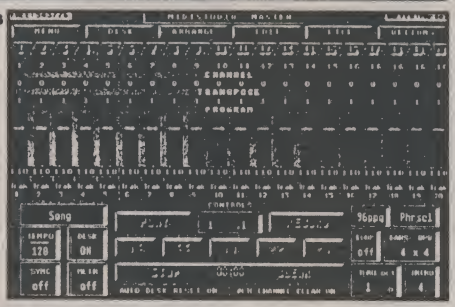

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VOLLEYS AND THUNDER...

Tired of the annual Wimbledon rain-and-hailstones commentary? Colin Campbell takes the covers off of tennis, self-service style

Tennis looks harmless enough, but it's just half a notch down from boxing on the ruthlessness scale. Outrun, outwit and outmanoeuvre the opponent and then psych the son-of-a-bitch. They don't make tennis players like they used to – nowadays they're good.

Computer tennis is much the same. In the past three years it has graduated from tame slap-shot to three dimensional murder. To hell with pretty graphics – we want it rough.

Wimbledon always brings the pre-adolescents on to the streets, armed with racquets and a somewhat less than healthy desire to get in the way of traffic. Some of us have grown out of whacking Slazengers while trying to dodge Vauxhall Vivas and have retired to the safety of silicon.

If you're thinking of taking time out for computer tennis, you're in luck – the choice is limited to half a dozen good games. Here are the *Express* top seeds (plus a few outsiders)...

3D INTERNATIONAL TENNIS

• Palace: ST, Amiga, C64, Spectrum. CPC soon.

Any pretence at aesthetic electro images is hurled through the window in a clear attempt to emulate real tennis fury. All the characters look ridiculous, but they move with such grace. Of all the tennis simulations this is by far the most tennis-like; all the more surprising that it comes from a company not known for attempting to smash pre-determined standards.

At first the wire-frame figures appear unformfortable, but it soon becomes apparent that you can do pretty much anything with the ball. In themselves, top- and side-spin are relatively easy to achieve; getting the spinning ball to land in the appropriate spot is a different matter altogether.

3D Tennis has dispensed with sporting niceties. It's all about earning money and climbing the tables by whipping the trousers off your opponents.

ADIDAS CHAMPIONSHIP TIEBREAK

• Ocean: C64, ST and Amiga. Other formats soon.

A little less frenetic, but certainly prettier, is Ocean's brand new overhead-perspective tennis effort. Curiously, there's no need to press the fire button, as just getting the joystick movements correct will ensure a good ball.

Tiebreak offers less than *3D International* in its range of shots, and the overhead view lacks ingenuity. But it's good simple fun and offers a broad spectrum of options.

There is the choice of grass, clay or indoor tennis as well as numerous sporting events to try your hand at, including Wimbledon and the French Open. Once again Ocean has served up an ace with this effort.

For those cheapskates among you out there: you might also be interested in budget offerings on the Hit Squad label. For example, for £2.99 Konami *Tennis* and the classic *Matchpoint* are worth a look, even if they are terribly dated.

PRO TENNIS TOUR

• Ubisoft: ST, Amiga, Spectrum

Originally brought out for Wimbledon '89, this French offering gives you the chance to get to grips with the big names in international tennis. Fat graphics are impressive even if movement, while not exactly slow, is some way off blistering.

You view the game from the back of the court and the only difficult part of playing is getting in the correct position to return balls.

In this manner there's little in the way of frustration and Ubisoft has ensured that anyone can quickly graduate to a respectable place in the world rankings. Be warned though, becoming the world number one takes a degree of practice beyond the patience and ability of most people.

TENNIS CUP

• Loriciels: ST and Amiga

Definitely one of the most complicated tennis games around. The screen is almost multimedia, with split representations and varying sections.

Indeed, it will take concentration on an cyber level to take in all that's happening. Add to this the astonishing range of joystick movements that have to be mastered in order to play the full gamut of shots, and you have an especially challenging game.

As with most good tennis games, there are plenty of options. *Tennis Cup* has been crafted with style, and is a good way of showing off your hardware as well as having fun.■

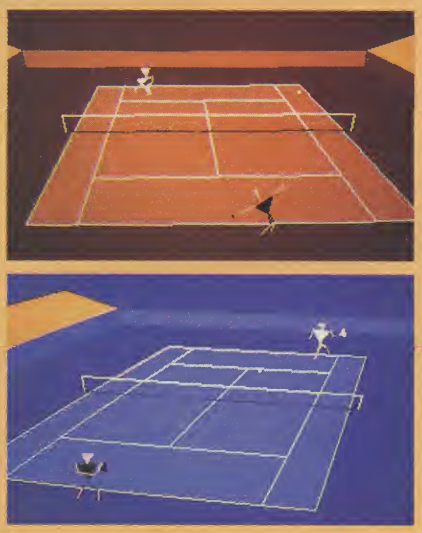
ON THE CONSOLES

For the Sega try *Super Tennis*, but for younger members of the family there's always *Snoopy Tennis*. Sega also has a hand-held game called *Tennis Star*.

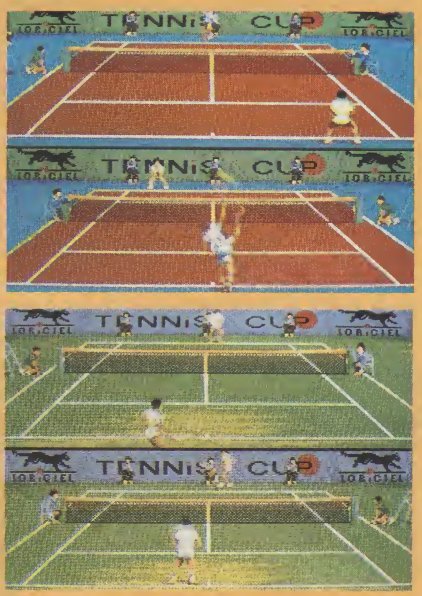
However, the Nintendo Gameboy's *Tennis* is nothing short of brilliant. The bigger version loses some of its charm, but is still well worth adding to your collection.

PC Engine owners should try *International Tennis* which makes full use of the console's capabilities.

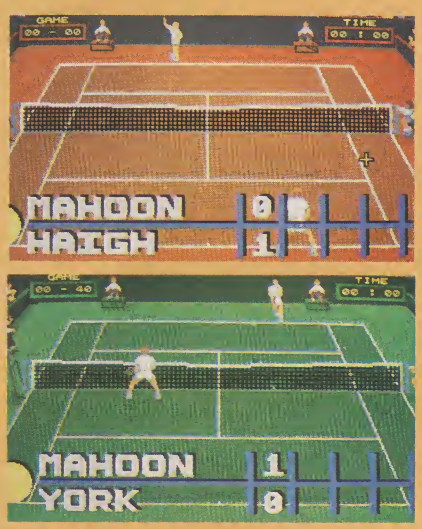
SMASH HITS



• 3D International Tennis: *most life-like of the lot.*



• Tennis Cup: *it's a challenge to mind and reflexes.*



• Pro Tennis Tour: *a big name boon.*

KICKING UP A STORM

Maff Evans dons his Nikes and heads out to the turf to put *Kick Off* 2 through its paces. Is it another World Cup tie-in searching for the big payoff or is it the next best thing since the original?

A few years ago if anyone had dared to speculate that a small company like Anco (known previously for strip poker games) would come up with a smash hit football sim which would then go on to win the coveted Game of the Year award, he or she would have been laughed into the world of humble mumbles. But Anco was the one to laugh last with the release of the now-classic *Kick Off*.

Many a football game had come and gone, but never before had a computer game managed to capture all the feel of actually booting a ball around the field. *Kick Off*, with it's superb method of control, combined with its breathtaking speed and precision play, managed to bring the athletic atmosphere of a good kick-about into the homes of computer fans. After playing one, all to short, ten minute game it was no surprise to anyone who knew what was good for them that *Kick Off* was such a massive, and instant, success.

Soon enough fans were crying out for more, and Anco released an update in the form of *Kick Off Extra Time* – an expansion disk that allowed the game to be altered with different pitch conditions and adjustable kick power. This boosted the game a little, but was not greeted with anywhere near as much enthusiasm as its predecessor. Now all that has changed – the wait is over. *Kick Off* 2 is here – at the cost of £19.95.

The successor retains all the fun, speed and excitement of the original, but it has a surprising number of additions that make it much more than a straightforward sequel. To begin with, the already excellent graphics have been re-designed, so that the players, ball and pitch are both more detailed and more impressively animated, as well as having clearer and more colourful presentation screens.

Kick Off 2's refinements go much further than cosmetic re-touching and visual embelishments, however. The gameplay has become far more varied and interesting, with more options, competitions and capabilities than you can shake a scarf at.

A full league or cup competition can be played, with each person (up to four people can play at once) selecting a player to represent them as they bid for Barnes and Baggio like glory. Furthermore, different team formations can be called up during the game at the press of a button, and you can even substitute a player who isn't playing to the best of his ability. The 'play in position' option which was introduced in *Player Manager* is also retained.

If you own a copy of *Player Manager* and wish to make use of teams and tactics you've already designed, then simply get your *Player Manager* 'saves disk', load up the necessaries and get on with playing. By combining Player Manager teams and tactics with *Kick Off* 2, what you have in effect is a two-player Player Manager!

One of the most interesting features of *Kick Off* 2 is the ability to load in 'special events' disks, such as Superleagues and European competitions. In fact, the package comes with World Cup '90, a tournament which includes all the teams in the real tournament – even the same groupings!

Add to this the ability to design your own kit, include curve shots, different pitches (normal, wet, soggy and the incredibly fast plastic pitch) and variable wind strengths (the high wind is almost ridiculous). The only thing more realistically footie-like than *Kick Off* 2 is getting signed up to Accrington Stanley!

The anticipation of *Kick Off* 2 which had been instilled in fans by the original has been more than justified. It's incredible how much has actually been added to the original – going back to plain old *Kick Off* is now almost impossible!

In summation, the graphics of *Kick Off* 2 are superb, the sound realistic and the playability out of this world. If this game doesn't have the same success as *Kick Off* and *Player Manager*, then the earth has been zapped by an alien stupid-o-ray. Get hold of the money any way you can, and go out and buy a copy now. It's the computer football event of the year!■

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3 • A frantic scrabble as the blues try and clear the dangerous ball. Kick Off 2 sports improved goalkeeping though, so the defence doesn't need to worry too much about letting the ball slip through.

4 • Each team can have both the first and second strip customised to taste. Yes, you could have England playing in a pink and green strip - but you're a bit warped if you do!

5 • The blues build a defensive wall against a free kick. Complex set pieces can be carried out by the attacking team to try and break through the shielding defenders and catch the goalkeeper off his guard.

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The ABC is a reliable, high performance computer, built to exceptionally rigorous standards. It is well designed, to a state of the art specification, maintaining maximum expansion capability for the future. This includes up to 4Mb of RAM and 3 AT expansion slots. Plus, unusually for a PC at this price, the ABC has the ability to install two or three extra drives, with the cabling already inside the CPU.

The ABC has a host of impressive features, all built-in as standard, encouraging simple installation and ease of use. In addition, the ABC's small footprint and quiet operating, mean that you will notice it less on your desk than other PC's. Except, of course, when you begin to take advantage of its AT power.

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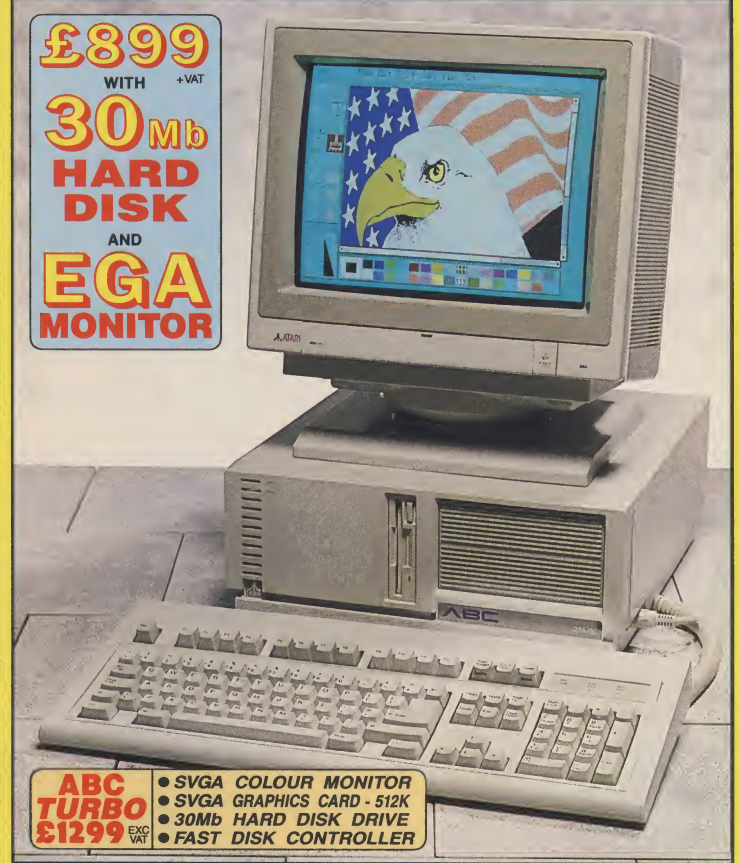

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Somewhere in this issue of *Express* – in the editorial or in an ad – is the word BATRACHOMYOMACHIA. Find the word, then fill in the number of the page it appears on (and that means a page other than this one) in the space provided on the answer form.

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SO YOU WANT TO WORK IN COMPUTING?

First there was the industrial age, then there was the electronic age and now it's the age of the computer. Keith Pomfret looks at some of the options available for those who want a career in computing, and he delves into the history of how the computing age has come upon us...

The statement: ' I'd like to work with computers' no longer means that you have to be a punch card operator or a programmer, it can mean many things.

The National Curriculum makes educational demands that include information technology. Consequently, the public education system offers several ways for a school leaver to get into computing. One of the most popular and most common routes is via an Information Technology College (ITeC).

The Government set up the ITeCs in order to provide full and comprehensive training in all aspects of computing, systems and information technology. On top of their educational brief, the ITeCs were to provide a valuable interface with industry and commerce as well as creating a greater awareness within current and future workforces. The ITeCs also planned to keep the trainees and the workforce up to date with the latest technological advancements.

WHO'S ELIGIBLE

The catchment area of an ITeC can come from three distinct sectors; teenagers can be offered a place as part of a Government youth training scheme. In a reversal of the work placement process, industry can train and retrain staff in the new technological ways via an ITeC. Unemployed adults can also be trained at an ITeC, getting an allowance of between £35 and £90 per week while attending.

Not all ITeCs can offer every computer related subject but they can train a person in areas such as the electronic office and other aspects of electronics and technology. There are various courses and qualifications offered. At the end of a two-year stint at an ITeC, a student could expect to come away with a BTEC (Business and Technician Education Council) or at least a City and Guilds qualification.

Depending on the area in which you live, finding a place at an ITeC can be anything from quite difficult to completely impossible. Some ITeC courses are oversubscribed by several times and one lecturer told *Express*: "If I had twenty times the places that I have now, there'd still be a queue of potential students waiting to get in." It isn't always that difficult but it may take a concerted effort to get the training that you want.

BEWARE TEAPOTS

In the main, the ITeCs are well thought of, but for the trainee it isn't always a bed of roses. Some ITeCs proudly provide a high standard of training and work placement while students at other ITeCs moan of placements where they do naught but make the tea. The ITeC ethos is fine, but if it isn't carefully policed it can prove counterproductive to the general morale.

The ITeC system offers many necessary training facilities and being Government sponsored, does so without a heavy financial drain on the person or organisation being serviced. It is a good, middle of the road introduction to technology without too much culture shock and may provide all the training that a student needs to go on into computing.

A word of warning though: the present government has reduced funding and, in the last couple of months, several ITeCs have been forced to close through financial hardship. However, the ones which remain open may give you the direction needed to channel interests and abilities to higher qualifications – just make sure you apply as soon as you can.

SHORT AND SWEET

Company or self-financed short courses are another option. We looked at five courses, costing between £150 and £220, which are offered by the City of London Polytechnic. These run during the summer vacation and are good indicators of the types and quality of the short courses that are available. All of the courses in this instance are graphics-based, but you could also find courses in everything from simple programming to systems management.

An introductory course in paint systems covers 8-bit broadcast-resolution paint systems and gives an essential background in the theory behind the technology. Image capturing is included, and the course is suitable for those with no computing experience at all.

If the appetite is whetted, the 'Advanced Paint Systems' course can build from the introductory sessions. As well as taking all of the basics into greater detail, it covers advanced topics such as output technologies and offers an introduction to the U-Matic video recording system.

Both courses seem to find a middle ground between art/graphics and the media technologies and would seem to be ideal toes in the water for someone wanting to follow either of these paths. The fact that you

WHERE TO GO

- Buckinghamshire College, High Wycombe. Tel: 0494 22141
- Computeach, Jews Lane, Gornal, Dudley, DY3 2AH. Tel: 0384 458515
- JHP (Pitman) Sunderland House, Matlock Road, Foleshill, Coventry CV1 4JQ. Tel: 0203 667891
- London College of Printing, Elephant and Castle, SE1 6SB. Tel: 081-735 8484
- London City Polytechnic, 84 Moorgate EC2M 6SQ. Tel: 071-283 1030
- Molesey Education, 10 Matham Rd, East Molesey, Surrey KT8 OSU. Tel: 081-941 1364
- National Association of ITeCs, Dr Matthew Dixon. Tel: 0298 814087
- Watford College, Hempstead Road, Watford, Hertfordshire WD1 3EZ. Tel: 0923-571617

can talk directly to lecturers, combined with the content of the courses could only help to guide a prospective student into appropriate full time study.

DESK TOP PUBLISHER

For someone interested in the production side of publishing, City Poly's 'Introduction to Desk Top Publishing' course offers four days in which the absolute beginner is guided through the basics of an Apple Macintosh computer. They are then shown how to combine word processing, art and graphics, and page setting using appropriate software. Other topics include digital typography, the PostScript page description language and its grids, digital printing with laser printers and finally, the commercial Linotron.

A course in 3D computer graphics promises a broad background in the subject. It aims to teach the basic principles of data structures, transformations, perspective, interactive modelling, rendering, hidden surface removal and animation.

As well as theory, presentation of slides, 3D, solid modelling and visualisation are also included.

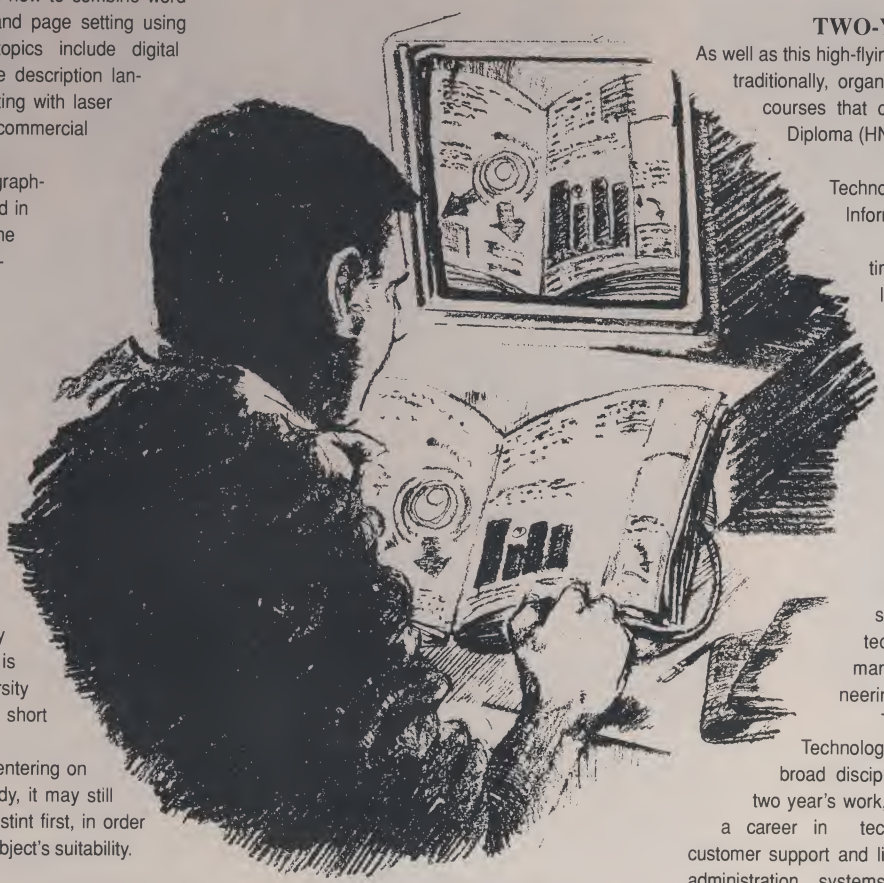
Remaining with graphics, but this time of a different kind, is the Business Graphics course. This is perhaps more suitable for a corporate student wishing to hone the company presentation. Nonetheless, it is included here to show the diversity of training available in just one short course subject area.

Even if you are thinking of entering on a more prolonged course of study, it may still be worth trying a short summer stint first, in order to check your aptitude and the subject's suitability.

GOING ALL THE WAY.

Full-time, full-length courses are a commitment that should not be taken lightly, but they can serve you well if you plan carefully. Three courses on offer at The Buckinghamshire College illustrate the traditional route although, with the single European market around the corner, one of them has a twist in its tail.

The Buckinghamshire College contacted *Express* to tell us that they were combining a foreign language course with one on information systems and that they intended to send students abroad for placements. Two faculties have combined their expertise to make sure that, when the free market arrives, at least there will be some UK graduates ready to take on the rest of Europe on their own terms. The combination of the academic, the practical and the applied, aims to produce graduates able to pursue a career in information systems and business, both in the UK and abroad.



FOUR-YEAR COURSE

The four years of the course start with a year studying software development, computer fundamentals, applications, business and either French or German.

A second year is started with six months industrial placement followed by a return to college for systems analysis, software development, computer systems and the chosen language.

The penultimate year will be spent in France or Germany. A semester in a French or German college will be followed by a six month industrial placement in the chosen country.

The final year, which ends with a project, intensifies to include European business strategy, European systems implementation and various advanced options. The prize at the end is an honours degree in Information Systems for Business in Europe.

TWO-YEAR HNDS

As well as this high-flying course, there are some, more traditionally, organised though intuitive two year-courses that culminate in a Higher National Diploma (HND).

One is simply, 'Information Technology' and the other is 'Business Information Technology'.

Information Technology is a full time course organised around lectures, seminars, group working and laboratory and workshop sessions. As well as the normal college based-work, projects for local companies and European exchange visits are included.

On attaining an HND, a student will be exempted from the first part of the British Computer Society Exams. Possible jobs include system design and analysis, technical marketing, database management and systems engineering.

The Business Information Technology course follows the same broad disciplines. However, at the end of two year's work, a student should be ready for a career in technical marketing and sales, customer support and liaison, office management and administration, systems management and business analysis.

The Buckinghamshire College is only one of many offering traditional Higher National Certificate (HNC), HND and degree courses and a phone call to your local polytechnic or university could pay dividends.

PRINT AND BE DAMNED

Colleges, such as the Buckinghamshire in the public education sector, don't necessarily have to stick to gen-

FIRST DEGREE LEARNS

Traditional paths

For the person who wishes to take a more traditional route through the academic world to a computer-based career, there are the polytechnics and universities. Twenty years ago, it was a simple matter of choosing computer studies and then specialising in a particular branch such as programming or systems analysis. Nowadays, with many more jobs being technology orientated, the decision isn't quite as simple.

A person wishing to go into commercial art, accounting, commerce, publishing, or any of the hi-tech businesses of the 1990s, would benefit from some sort of training in computing. The rule here is to be selective ; an arts course wouldn't be much use to an accountant and a spreadsheet wouldn't enthrall an artist.

List your needs

In order to pick the course that you need, it is necessary to draw up a list of your absolute requirements. Add to this a list of things that, while not essentially required, are certainly desirable. Then check the lists off against what's available. Many colleges offer introductory and pre-degree/qualification courses to allow potential students to try out a subject in order to learn a little about it and ascertain its suitability.

With the hundreds of higher education establishments in the UK, all geared up to teaching computing or computer related subjects, it would take a book of several hundred pages to cover them all in any detail. Instead, we've looked at a few possibilities to show just how diverse computer orientated training can be.

Make contact

To choose your polytechnic, university or other higher education course, it's worth contacting all the colleges that have suitable courses in their curriculum and discussing the application of a course to your needs.

The admissions tutor for a particular course can be a good starting point and, if you can afford it, it is worth a trip to any potential college to see the equipment available.

Local Careers Advice Offices and school careers teachers usually have lists of al university and polytechnic courses available for the coming year.

How many machines

Another important requirement is to know the ratio of computers to students. If you are to learn a computer-intensive subject, it won't be much use if there is only one machine to ten students.

One of the recent trends is toward short intensive courses designed to whet the appetite of the beginner, or top up the knowledge of the experienced.

Many polys and colleges do these and a few days for a few hundred pounds can be time and money well spent when choosing a career or planning a regime of further training.

THAT WAS THEN ... THIS IS NOW

During the industrial revolution, people flocked in their thousands to the newly expanding towns and cities to learn the skills which the clattering new machinery brought with it.

Status could be achieved by simple mechanical knowledge and the will to apply it. The dark satanic mills with their mechanisation and increased production, greedily gobbled the willing workers and taught the new way of life.

Electronic age

The latter half of the twentieth century has seen the dawn of the electronic age and the microchip revolution. The thermionic valve has become a transistor and that in turn has become part of an integrated circuit. The integrated circuit, or chip as it is commonly called, is hungry for disciples and is ready to mould our careers and change our lives.

A recent survey showed that there were over 53,000 unfilled vacancies in computing and the number is growing every day.

Vaulted halls

As recently as the 1970s, working with computers meant stealthily treading air conditioned vaults and feeding the massive machines their diet of punch cards. A job in computers meant endless typing of such cards or programming in some pedantic high level, number-crunching or business-oriented language.

The 'glamourous' career in computing bore no resemblance to the image held of it by the public but still the myth prevailed.

Desktop computing

At the end of the 1970s, computers were shrinking in size but growing more powerful in processing capacity.

By 1980 a computer which could just about sit on a desk could do the same sort of work as one that had filled an auditorium a couple of decades before.

The compact size and increased power of computers today has placed a powerful tool in most offices. It has also produced the need for skilled people to operate these tools. From the smallest one-man band to the largest international conglomerate, all commercial, industrial and educational establishments need a computer literate workforce.

Public Education

From the late seventies, schools and colleges began to include computing in their curriculums.

Universities, colleges and polytechnics had their mainframes and mini-computers while primary and secondary schools opted, in the main, for the much sponsored (and subsidised) BBC B micro-computer.

eral courses. The London College of Printing offers a wide range of print related courses on design, journalism, business studies, photography, pre-printing processes, machine printing, and various other technology-related prospectuses.

As well as the colleges run by the education authorities, there are many commercial organisations offering training in computer-related subjects at all levels. These can be residential, correspondence or attendance based courses and can cover everything from grass-roots programming in Fortran to 'How to use a Word Processor.'

LEARN THE BASICS

The general courses in application software can be a useful way to learn the basics of a package and there are even courses that travel to you. For the individual, these can work out to be quite expensive. However, for a company wishing to train or retrain its staff in word processing, databases, spreadsheets, or programming, on-site group tutition can be the simplest, most convenient and cheapest method.

An example of this mobile system is Molesey Education which offers training on PC, PCW, BBC and other systems. Its latest course, LocoScript on the PC, costs £30 per hour plus £10 per hour travelling time. It is suitable for classes of up to five people. In this way, a company can get five of its workers trained for a day for under £250 without them leaving the office.

Other companies offer similar training and some organise hotel seminars where individuals can join and be trained for a fraction of the cost.

HORSES FOR COURSES

Another company currently offering a broad range of services to the individual is JHP (Pitman) of Coventry. The Pitman system is more often associated with shorthand, but the range of courses run by JHP can offer a student an effective route into computing at any level. JHP provides courses for individuals, groups, companies and government agencies. One might find a JHP course through a government employment training scheme or a company seminar, among other sources. Whichever route you take to get there, the quality of the training is claimed to be high and the courses are designed with specific ends in mind.

A student wouldn't be thrown straight into an unsuitable course. On the systems analysis course for example, a battery of aptitude tests are fired at the student in order to make sure that they have the capability to perform in the chosen field. Bearing in mind the sort of stresses and strains that are involved in systems analysis, a further test of a student's abilities is a 'hostile' interview. JHP says it firmly believes in filtering out the wrong people for each job. Courses lead to various standard qualifications including City and Guilds. The company also has regional centres offering various other courses and qualifications.

COMPUTEACH

Well known among the commercial institutions offering training in computer languages is specialist Computeach. Formed over 25 years ago by its present chairman, it claims to be the oldest established computer training college in the country to specialise in open learning. In this system, the main programming skills are still taught but instead of getting the students to come in, the information and coursework is sent out.

The original Computeach package was a distance learning course similar to the Linguaphone language system. As computers and technology have evolved, so have the courses. A mixture of text books and audio tapes are tied into attendance at a licensed learning centre. This offers the student the flexibility of being able to study at a preferred pace, matching study with spare time, and yet still provides the direct contact so necessary to interactive learning.

Computeach claims over an 80 per cent exam pass rate and was honoured by the City and Guilds institute this year when a student won a top award, a Prince Philip Bronze Medal.

A COURSE UNDER THE MICROSCOPE

With many colleges offering a plethora of courses in the various aspects of computing, we decided to take a 'middle ground' course and have a closer look.

We chose Watford College for its existing expertise and looked at its new software engineering HND. While an HND is a sub-degree qualification, it is fast becoming the industry standard from which software developers and engineers develop.

In October 1989, Watford College launched its pilot scheme, an HND in software engineering. The two year course was a logical follow on to an HNC course which had been in existence for a number of years. The HNC was found to be a useful introduction and the HND pilot scheme was the logical progression.

The pilot was a success and a new version, starting later this year, will retain the overall structure of the pilot while incorporating the lessons which were learnt from its first full year.

Watford College got into software engineering at the beginning. Industry demanded a workforce trained in the production of correct, robust, high quality software. The quality wasn't the only option though, it had to arrive to a deadline and to a budget.

The college realised that by applying similar disciplines to those in other engineering areas, programs could be written that would run faultlessly first time.

The HND course covers the full range of software design principles and languages such as Pascal, C, and 68000 assembly language. Students will learn how to solve the same problem in several languages as well as how to handle interfacing. Documenting the programs, so that they can be modified at a later date by other people if necessary, will be taught and a student can expect to learn about the innermost secrets of a machine.

The course would be ideal for someone who wants a career in computing while not necessarily wanting to spend a full three or four years on a degree course. The HND is an advanced, nationally recognised qualification treated by many prospective employers the same way as a degree.

The course qualifies for student grants and course fees can be paid by local authorities. In addition, sponsorship is available from companies who recognise the value of the qualification.

To qualify for the course, applicants should have an 'A' level in any subject and perhaps a BTEC National certificate. Other qualifications may prove acceptable though, as the prospectus says: 'the most important criteria is the ability to succeed on the course.'

Students can expect to learn subjects such as:

Introductory and Advanced Software Design
Computer Aided Software Engineering (CASE) Tools
Pascal Programming
Ada Programming
System Design
Project Management
Graphics Software Real Time Programming
Compiler Design
Artificial Inteligence
Computer Architecture and Interfacing
Operating Systems
Oranganisation of Systems Development

A student enrolling at Watford college can expect to come into contact with a wide variety of machines as well as a wide and varied curriculum.

The hardware line up at Watford College includes the following:

BBCBs, 68000 microprocessor development systems, 68020 in circuit emulations, PC/AT workstations, and a VAX Cluster running VMS as well as Unix and solid 3D Modelling Graphics Software.

If Watford's the place for you to study, you can get more information from course tutor, Howard Mainwaring on 0923 57613.

TECH TIPS

Does your PC keep packing up? Is your Amiga less than friendly? Would your ST try the patience of a saint? Send your sorry stories to UncleTech Tip, Beauford Place, 30 Monmouth Street, Bath BA1 2AP. Sorry, but we cannot reply by post, even if you enclose an SAE.

Tip! And tat

My son has a Commodore Plus 4 and he has asked me to fit a disk-drive for him. I have some spare drives for my Amstrad PC1512, and I would like to know if it is possible to fit one of these?

I also have a tip for you and your readers. On a two-drive PC XT insert this line in the `CONFIG.SYS` to configure drive B: as 720Kb.

```
drivparm=/d:1
```

My most heartfelt thanks for all you have done in your column to help in the past, and I will be sure to pass on any more tips I come across in my nightmares on my Amstrad .

T A O'Conner, Devol, Port Glasgow

The bare drive from a 1512 will not simply interface to a Commodore Plus Four. As well as being physically different from the Commodore beastie, the matter of controlling the drives could prove more than a little difficult for the Plus Four's operating system.

Help! Correct currency?

If I buy a modem from the states, will I be able to convert it to work here?

Nick Taylor, Sunderland, Tyne & Wear

A modem purchased in the US will be designed to work from 110/120 volts at 60 cycles. If the modem plugs directly into the mains, you will need a transformer to step down the UK 240 volts to the US 110 volts.

If the modem works from an external transformer, replacing it with a suitable UK mains transformer should be OK. If the modem is on a card for a PC or similar, it should slot straight in and work. We tried three US modems (one of each kind) and had no problem persuading them to work despite the frequency difference (60 cycles US/50 cycles UK).

Something to bear in mind is that the modem that you purchase must support the on-line protocols that you need to access: V23 (1200 recieve/75 send) is not generally supported in the US.

Some UK BBSs and UK Viewdata systems still operate exclusively at V23. To be sure that the system that you buy is compatible, check with your supplier in the US (by letter or phone) that the modem you intend to purchase is fit for the use that you intend it for. If it isn't, it's a long walk back to change it.

Help! To be in business

I am 20 years old and I desperately want to become a business programmer

I have no qualifications yet, although I am currently studying GCSE Maths and English, and I have worked as a freelance programmer, programming in Z80 assembly.

I have always wanted to become a games programmer which is why I have no qualifications – I spent most of my time learning machine code on my Amstrad CPC 464.

Now that the 464 popularity is declining and, the 68000 chip seems to be the one to learn, however, I am wondering if it is really worth my while learning a new chip as business programmers earn a hell of a lot more money than games programmers do, unless you are outstanding and work 12 hours a day. What do you think?

What course(s) do you think I should take to become a business programmer? I was thinking of taking a BA Degree with the OU in programming (which covers PASCAL) or I could go to college and take a BTEC certificate?

I would also like to learn and be qualified in MS DOS, UNIX Framework III, DBase, COBOL and C: what courses would you recommend to learn these?

I am also soon to start my own mail order business selling computer software, and I want to keep all my accounts and all of my stock on the PC (so if a customer phones me I can see on the computer if I have what they want in stock and if not, I can order it), and also I would like to keep all my orders on the computer and word process and spell-check letters.

What PC machines would you recommend so that I can learn business programming, play games and run my business? I was thinking of buying and Amstrad PC 1640 with a hard drive.

Dave, Ushaw Moor, Co Durham

You picked the right week to write to us on this subject. Elsewhere in this issue is a full blown educational feature in which we look at the prospects for a person wanting a career in computing.

That will no doubt answer your questions more fully than any letter reply could. If you had already considered the 1640 and hard drive and considered that it would do the job that you require, go ahead and get it. Thousands of 1640s are out there doing sterling service and while they aren't exactly state of the art, they are certainly a well specified, functional machines.

Help! Wanted: more joy

We own an Atari STFM used by myself mostly for word processing and by the kids for games. Can you recommend a good, *robust* joystick for the shoot-'em-up fiends in my family? They've got through 2 since Christmas.

Mrs Jacqui Espin, Chadwell St Mary, Essex

I looked round my Macintosh for a whole five minutes but couldn't find anywhere to insert a joystick. Our colleagues at *Amstrad Action* and *ST Format* were able to help, though, and after frantic mumblings about random autofire and microswitches, declared the Power Play Cruiser to be a robust beastie.

It also has an adjustable collar that means you can re-jig the firmness of the stick movement.

Help! Add-on concerns

I was wondering if you can get any cards for the PC which contain the Intel 80486, or Intel 80886 – to fit an expansion slot or wherever it's supposed to go?

So let's say we have a relatively slow and weak PC, and plug in any board which contains these chips to transform it into a powerful computer. How much do you think they will cost?

Also, can you tell me if I add a PC emulator and a 5.25-inch disk drive, can I then run most popular PC software, including popular games and flight simulators, eg *F19 Stealth Fighter* and *F16 Combat Pilot*?

Finally, if I add a 5.25-inch disk drive to the archimedes with BBC emulator, does this mean I can run lots of educational software?

Mike Bekket, Dagnem, Essex

No you can't. No there isn't. What? And yes you can.

Help! Bard times

I have an Olivetti PCS 286 with a 20Mb hard disk and a Star LC-10 printer which I write plays on. I use *Topycopy Plus*, and it all works brilliantly – until I start to print. Then it works slowly.

A sign comes up on the screen that says 'Printing' (as if I didn't know) – presumanbly while the computer is loading the data of the file into the printer's buffer. Until it's finished that, and the sign goes away, I can't work on anything else. On a long document (and I create plenty of them) this can take up to 10 minutes.

Given that this machine can do just about everything else far faster than I can even begin to think, this print routine seems to me like an unneccessary waste of time.

My dealer says the answer is for me to spend more money (well, he would, wouldn't he) on a "Parallel In-Line Buffer" which will solve my problem in a trice.

But there must be acres of unused space inside my computer somewhere, if I knew how to get at it. Can you help?

John Clifford, Roslin, Midlothian

Set up a RAM disk (refer to your manual for instructions) and install a print spooler program.on your system. Set the print spooler to spool to the RAM disk. A suitable print spooler can be obtained from Shareware Marketing on 0297 24088.

Help! The upgrade story

Back in March, *Express* 70, Jonathan Guyver wrote a letter asking details of how to upgrade his PCW 8256. Mr Guyver indicated he had instructions on the method, and you advised him on a source to obtain the bits.

What I would like to know is how he got on, and did he complete the project?

I would appreciate Mr Guyver's full address so that I may contact him directly

address so that I may contact him directly to ask – or maybe you would print my request with my address, and he may contact me if he reads the request.

One more thing, is it possible to couple a PCW to a Spectrum Plus 3 via the non-standard RS232 ports? A wiring diagram would be appreciated if this is possible.

Keith Taylor, 341 St Nicholas Driv, Wybers Wood, Grimsby, South Humberside, DN37 9RD

We've left your address in to allow Mr Guyvers to contact you.

The Spectrum and PCW can indeed be connected down the non-standard connectors, but to do this would be a simple way to court disaster unless you truly understand both machines.

Assuming that you can get software for the Spectrum end, you can connect a null modem cable from the Spectrum to... errr, a serial port. As there isn't one on a PCW, you'll have to go out and buy one.from Amstrad or SCA.

Help! Coupé questions

We were concerned to see that MGT had been placed in the reciever's hands only weeks after we took 'good' advice and bought a SAM Coupé. I gather that several thousand have been sold, and I wonder what we will be able to use them for.

After investing £160 in the Coupé we are worried that we may have bought a slanting breeze block. As it has a Spectrum emulator does this mean that with the right software it could be made to emulate a PC?

Could suggest alternative uses for our premature white elephant?

Anon

The Coupé cannot be converted to use MS/DOS as it has the wrong architecture. It only emulates the Spectrum because it uses the same central processor (Z80) and was designed with Spectrum emulation in mind.

As for a list of uses for a Coupé, we contacted MGT MIDI programmer, Joseph Karthauser, and he gathered this list from his programming team.

1 Bootscraper

2 Spoiler for an XR3i

3 Lunchbox with slots for sweet and savoury snacks

4 CD store box.

5 The power supplies make good giant lego bricks

6 Put wheels on and use as a skateboard

7 Wheel wedges for parking on hills

8 Main T-shaped circuit board as a boomerang

9 Use the keys for a good game of *Scrabble*

10 Paperweight.

Help! How fast?

Just a short enquiry about your favourite pastime (computers).

At present I'm thinking, (not too strongly, since I'm a bit short of the old green stuff, or is that blue stuff, these days), of purchasing a computer. So far I've decided on an IBM Compatible, possibly 286 type, with the usual colour CGA monitor, etc.

However, I was wondering whether the Archie is capable of 286 emulation. I understand it can emulate the 'normal' IBM 8086's type, but what about the new generation (286, 386, 486)?

If the Archie can do as requested, is it any faster, slower, smarter, bigger, brighter, sexier or is it a no goer in these arenas?

Tim Taylor, Birkenhead, Wirral

While the latest version of the Archie PC emulator does a pretty whizzy job of pretending to be the lesser 8086-based PC, it doesn't quite have the steam to emulate the 286-based PCs and other such devices.

As a straight PC emulator the Archie is fine, but even its 32-bit RISC architecture isn't up to pretending to be an AT.

Tip! Flying on an LC-10

Although I did not read Paul Gardener's original letter, I gather that he has been having problems with control codes for the LC-10. The advice offered so far in these pages is, I'm afraid, incorrect.

Instead of using `OPEN "PRT:" FOR OUTPUT AS No1`, he should `OPEN "PAR:" FOR OUTPUT AS No1` which bypasses the printer driver and is automatically sent to the parallel port. An example program:

```
OPEN "PAR:" FOR OUTPUT AS No1
PRINT No1, CHR$ (27)+"-
1"="Underlined Text"
CLOSE No1
```

Even though this does not use the printer driver, the `EPSONX[CBM_MPS-1250]` driver should be selected in Preferences.

Hugo Crossley, Oakham, Leics

Thanks very much for your hints. We get more letters about the LC-10 than any other printer, which means that it's very popular if a little quirky at times.

Hints and tips always come in useful – so if anyone has any ideas, LC-10 or otherwise, send them in.

Tips! For Mr Brown

Regarding Mr John Brown, (*Express* 83), I used to use a WS2000 on my old BBC, but now that I have a PC it's just not fast enough – though it did me well.

Now to the point, please find enclosed two manuals for the WS2000 – the early and the late version – as I no longer have any need for them.

If Mr Brown would like, I may still have the autodial board somewhere. It just needs a good home.

Thanks for a great magazine. And keep up the good work!

Steve Mendrys, Waltham Cross, Herts

I've put the manuals in a safe place and if Mr Brown writes back, I'll pass the manuals on to him. I'm sure that the autodial board will be gratefully recieved too, so send that in and I'll make sure it gets passed on as well.

In *Express* 83 in the 'Techtips' section, a Mr John Bown wrote requesting information on how to set up his Miracle Technology modem on his Amiga. I have the same modem and am using it quite happily at 1200/75 baud.

What he needs to do is get hold of a copy of a PD comms software package called *COMM134*, which will enable him to run his modem and Amiga at 1200/75 baud with no problems. To set his Amiga to run with *COMM134*, all he needs to do is open up his workbench, click on the 'Prefs' icon and then select 'Serial'. A screen will appear and the baud rate will be displayed at the top in a box somewhere.

If he then moves his pointer to the down arrow and clicks on it until 1200 is displayed and then clicks on either the 'Use' or 'Save' box, he will be ready to go. The PD software *COMM134* will take care of the buffering for him without problem.

If you pass on my work phone number (because my home phone has been dropped and doesn't work), I will be glad to tell him how to set up his modem for 300/300 baud rate and I will arrange to call him when I get home from work and upload to him the *COMM134* software that he needs to run at 1200/75 baud.

Stuart Walsh, Chadwell Heath, Romford, Work tel: 071-512 1000 ext 3221

Now there's an offer that he won't be able to refuse. What more can I say? Nothing.... OK, I'll shut up then.■

Help! Me and my Olivetti

First a note to Neil Barret of Leeds (*Express* 82) who had problems with his printer. Indeed, the little love is an Olivetti JP101 Printer. It only does NLQ (nearly laughable quality), indeed, this letter was printed on the very same, and I'm sure the editorial will vouch for just how bad it is.

Complaints aside, you can get hold of a copy of the printer manual from a very, very nice man at British Olivetti called Mr Les Bond, 15th Floor, CI Tower, St Georges Square, High Street, New Malden, Surrey KT3 4HH: phone him on 0812 336 1520.

Alternatively, you could upgrade to a John Bull printing outfit or, failing that, get yourself a sharp knife and a bag of potatoes to improve on your basic print capability.

I have a JP101 because it was only £5 as a shop soiled item. That's my excuse and I'm sticking to it.

My other item of well-dodgey hardware is a commodore Amiga Sidecar. It works well enough as a PC, but I can't get the Amiga to send files (eg ASCII & IFF) over to the PC side, nor will the transfer work in the other direction.

This should be simple according to the manual (ha!). It seems not to be set up properly. When the Amiga runs 'DJmount', things lock up a while till the PC replies something like 'Divide overflow' followed by some unfathomable numbers.

Is there anyone out there able to solve this one? I'm offering a personal letter of thanks printed on my JP101. This should be a hoot for the lucky recipient!

Frank Rickett, Sydenham, London

By the stroke of fate, find below a kind soul's fulfillment of your request. Our aim is to please...

I was reading your magazine, *Express* 82, and I refer to the letter of Neil Barret.

I own a JP101 printer made by Olivetti. I enclose a list of some codes. I hope they may help you. I use normal printer paper and find it works OK. I have a local Olivetti agent near me in Clydeforth: 041-248 7523. The nice man can supply you with inkjets for the printer and may be able to get you an instruction book as well. I hope this will help Mr Barrett.

Raymond Maitland, Netherlee, Glasgow

Codes	Effects	Olivetti Inkjet JP101
27, 34, 1	Underline mode	27, 42
27, 45, 0	Cancel underline	27, 4
27, 48	Spacing 1/8"	27, 69
27, 49	Spacing 7/72"	27, 70
27, 64	Initialise printer (reset)	27, 48
27, 82, x	Int. character set English x=	27, 9
27, 87, 1	Double width	27, 51
27, 87, 0	Cancel double width	27, 52
27, 104	Set double height	27, 39
27, 117	Cancel double height	27, 37
Graphics Commands:		
27, 75	Normal density bit image mode	27, 71squared

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This week's replies written by Keith Pomfret.

Get my name right!

Whoever changes his name to Fungus the Bogeyman – I have heard stories in the past on TV about this – must need a straight jacket. Why he can't keep his own name I don't know!

It is true that letters are cut down. I don't mind you cutting this one down because I'm writing for a laugh. But when I wrote for the first time to your Uncle Tech Tip, he cut it down considerably – by two thirds nearly. Please, in the future, cut down the silly letters but not the serious ones.

I must agree with Stuart Smith of Manchester (*Express* 83). The C64 is neglected a lot in your section and your columnist keeps rambling on about *@?!! adventure games. Can't he say something about us serious/arcade users – and I don't want it to be rude.

And finally, for those who wish to contact most probably the best serious C64/128 dealers ever, FSSL's address is Masons Ryde, Defford Road, Pershore, Worcs WR10 1AZ.

Thanks for a great weekly, and spell my name right this time!!
Bryn Stevensoslegogxplltt, Chesterfield, Derbys.

I've only hacked away at the silly bit at the beginning so you've had your say this time. If anything else is missing from your witty and rambling tome, blame our hard-worked production staff (Brother Feinbaum in this instance) It's his job to squeeze our weekly quart into *Express*'s pint pot.

Console cashflow?

Can you tell me why console manufacturers and software suppliers are asking people to pay from £20 to £60 for console software? If there isn't any piracy how can they justify charging these kind of prices?

I also think the leading software houses have decided to jump onto the console bandwagon so that they can produce even more rubbish and charge even higher prices for it.

Furthermore, I would like to say what an excellent mag *New Computer Express* is. Keep up the good work.
Sean Smith, Hemel Hempstead, Herts.

It's not piracy, it's just plain expensive. The reason that it's expensive is that the media that cartridges use (ROMs and EPROMs) are more expensive, and the production, manufacture and copying of cartridges takes more time and cash. Watch out for the Neo Geo with its £200 cartridges due soon.

Paradise

After reading the letter from Jeff in *Express* 84, I felt I had to jump to the defence of PD libraries. If he thinks most people working for a library make a "nice living thank you very much" he is quite welcome to join Paradise Computers and find out that, more often than not, we use our own money to clear bills until enough income has been generated to pay us back.

He says that PD is supposed to be free. True enough, but we do have to charge for a disk, a disk label, the free catalogue that we and most other PDL's give away. This does not include phone bills or paper and other expenses that most people do not take into account.

Another point that Jeff makes, that shows his complete lack of understanding of the subject, is that he mentions it costs more for Mac owners to buy PD. Ever heard of supply and demand, Jeff? It means people who have less popular computers have to pay more because there are fewer of them to cover the overheads.

Membership: if you don't like the idea, don't join!

If Jeff thinks that a PDL could be run by charging only 70p a disk, he's more stupid than his letter makes him out to be. With the exception of a few clubs, all of us work together and thus dispel the idea of PD being a business. Do competitors usually help each other? Most PD clubs are quite willing to let anyone know the secrets of running a PDL and thus have to be above board or else they would be found out.

Finally, people like Jeff should research points before accusing people of something that is just a figment of their over-active imagination. Leave the PDLs to give the service most people enjoy rather than trying to run us into the ground.
Ian Slater, Paradise Computers PDL, Brighton, Sussex

What more can I say? (*nothing – Ed*)

Neighbours

Thank you for inserting the free advert in *Express* 82, which drew an immediate response. However, for the benefit of my helpful next-door neighbour, I wish to point out that my number is 16 (not 15) and I would appreciate it if you would point out to those subscribers who have requested enhanced hardware or are considering doing so, that the group is really aimed at those who wish to make full use of the machine while keeping within the manufacturer's specifications.

We believe the use of compatible software makes it unnecessary to fit expensive unauthorised modifications.

My computer friends and I enjoy your magazine. Keep up the good work.
Joe Donnelly, Standard Sanyo MBC 55X User Group 16 Ulsterville Park, Portadown Co. Armagh, N Ireland

Thanks for the letter, We hope that relations with the neighbour haven't become too strained due to the numerical error. Still, if the chap at number 15 buys a Sanyo, we might all live happily ever after!

Punch and Duty

We read with interest the article in Express 83 regarding the Cajun Punch marketed by Ctrl Alt Deli. Having wrongly ordered a box of 720K 3.5-inch disks instead of 1.44Mb disks, we decided to try a little experiment.

Using the department A4 hole-punch we succeeded in creating the sensing hole as suggested in the article. All the disks we tried were then successfully formatted as 1.44Mb disks. The results were very gratifying to us, but bad news for CTRL ALT DELI, since it appears that any office hole punch will do the job equally well as their Cajun Punch. Our advice is: save yourself £39.95 and DIY!

Thanks for an entertaining read, and how about some more stuff on fractals? We find them fascinating but we're mystified as to what it all means. Perhaps you at *Express* could explain it to us non-mathematical types in your usual clear, concise and witty manner.
S.J. Thornton, London

The Cajun Punch is the right size, and correct fit to punch the hole in a 3.5-inch disk. Using a blunt nail and hammer, hot soldering iron, hole punch, vertical reamer, hammer drill, industrial laser, and various other blunt instruments in the *Express* office, we too managed to perforate the disk in the prescribed manner. In all instances, it would have been easier using the Cajun Punch.

The point is, most jobs can be 'bodged' in one way or another, but a sensible chap always uses the right tool for the job.

Turbo Coupé

Hello. You may have heard of *Turbo*, a magazine which caters for Sam Coupé owners. Well, it also has its own PD Library which is open to all people who subscribe. At the moment we only have two disks, which cost £2.50 each.

Disk 1 contains: *Snake* – eat mushrooms, avoid spikes and your growing body; *Strafer* – blitz a city before you hit a building; *Super Rally* – drive clockwise round a maze avoiding the other car; *Super Rally* – drive round 20 mazes collecting fuel and flags; two fonts – for the art package *Flash!*

Disk 2 contains: *3D Roomz*, *Banner Maker*, *Mandlebrots*, *City* and *Hi-Lo*.

We would be very grateful if you could give us a plug in your column. Are there any other people doing Sam PD stuff, I wonder? Thanks for reading this letter.
Adrian Betts, Editor, Turbo, *8, Healey, Lakeside, Tamworth, Staffs*

Yet another group of people set to support the ailing Coupé. Since MGT called in the reciever, we have heard nothing but promises of support and help for the beleaguered machine.

Now if all of these people could see their way to dipping in their pockets, there's a little firm in Swansea chasing some potential cashflow.... Send all offers to Touche Ross – the reciever.➤

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Heat of the moment

First of all, can I point out that my ZX-80 is much better than all those junky 16-bit machines. It's the only home computer with a cheap add-on seismometer – no matter how hard I shake my Amiga, the extra memory refuses to fall off.

When are you going to attract civilised readers by starting a Psion section? How many other machines enable you to retire to the local hostelry to program over a pint? No buying a magazine only to wait for BR to get its act together before you can try any ideas out.

Roger Musson made a mistake in his letter about composing music. He used the word 'good' where he should have said 'tired and cliched'. Or is he seriously rejecting as a waste of space 90 years of classical music and eras of wonderful non-European music? Does he believe music should be like heroin – agonisingly addictive? Pah!

Dylan Harris, Bedford

You forgot to mention that the power supply for the ZX80 would keep an igloo full of eskimos warm through the winter, or that its keyboard had a co-efficient of friction so low that London Transport now uses 4,000 of them as a skid pan to test the reactions of potential bus drivers.

We planned a Psion section, but our resident Psiontist got a job with an Italian washing machine firm and was last heard muttering about applying Psions. Psionara as the Japanese say (*no more puns or you'll be pun-ished – Ed*).

We aren't going to join the great music debate,as music is clearly in the ear of the beholder.

Little Deuce Coupé

In reply to Adrian Betts' letter in a recent issue that complained about MGT's service in regards the Sam Coupé.

Firstly, as an editor of a Spectrum fanzine and now a Coupé samzine, I'd like to say that if you're going to run a samzine around the Coupé, you're going to achieve nothing by whining about the hitches and mistakes Miles Gordon has made. Scrap your samzine, because you're not doing anyone any good, particularly yourself!

Secondly, OK, so the launch of the Coupé hasn't run exactly according to plan (we all know that the computer was late, the DOS was later and the emulator isn't so special), but you have to remember MGT is a relatively small company. Their most successful piece of hardware before the Coupé was a disk drive!

MGT is doing everything it possibly can to rectify the mistakes – at its own expense. You don't think the Coupé has increased in price to £179 for nothing?

Through all of this mess MGT has remained helpful, positive and loyal to customers. How many computer manufacturers do you know that have a recorded message full of general info and a customer care line?

So support MGT. It has taken a risk by launching the Coupé, and now it's time to pay the company the credit it deserves!

Edward Walker, RGB Coupé, Leicester

I'm sure that Alan Miles and Bruce Gordon will feel heartened by yet another supporting letter regarding the ailing company. The Coupé is developed and hopefully some long-sighted businessperson with an eye to the future will step in to ensure its continuity.■

Mr Grumpy writes, and writes, and writes, and writes

It is with a heavy heart and empty wallet that I read of the imminent demise of Miles Gordon Technology as reported in this week's issue of *Express*.

I am surprised, however, that no-one saw it coming. There are remarkable similarities between the company and Sinclair Research – both had brilliant computers which deserved to do well, both had wonderfully clever boffins working away 13 to the dozen, and both had (unfortunately) a remainder of staff that appeared to know as much about the computer as a toy rabbit.

An example: I wrote to MGT about sundry things, and in passing mentioned that in the Coupé manual under the heading of Disk Drives was the statement that each Coupé drive has slots for 256K of extra DRAM (sic). I asked if this was correct, and if so, how come no-one had brought it up before.

The answer I received stated that 'Coupé drives hold 720K'. Not only does this answer not answer my question, it is also incorrect! As any fool can tell you (at least after reading the manual) Coupé Drives hold 780K.

The people at MGT expect us to have no technical knowledge! In the second issue of the Disk manual (the one brought out at the same time as the DOS), they assured us that the reason for typing in `'CALL 491529'` after pressing F9 was to 'tell the computer what size memory you are using'. This, to anyone with a modicum of computer literacy, is a joke.

The major difference, of course, between Sinclair and MGT is that the Spectrum had time to sell a few million before Sir Clive could sabotage it with his C5, whereas the Coupé appears very likely to have sold even less than the MSX (in Britain) when MGT went down the proverbial drainpipe.

This is a shame. Most of us who use the computer are entirely satisfied with it (well, we will be when we get our ROM, and yes, I have sent my guarantee card back) and we have no wish for Amstrad to buy out the company and turn the Coupé into another QL.

I would like to wish the Swansea Enterprise scheme all the best luck in the world, therefore, in its attempts to prevent the demise of MGT. But to be honest, if the only reason for trying to do so is to preserve the 30 odd jobs in the company, then I say now – don't bother.

The staff appears to be the main reason MGT went up the spout in the first place. If our dear Alan decides he does want MGT, perhaps we can offer him a little advice. Why not use it as a direct upgrade from the old Spectrum, scrap the 128, Plus 2a and Plus 3 altogether and include the Spec's ROM on disk (along with changes to make the loading sequence work at the right speed), thus curing compatability problems once and for all?

The Plus 2a and Plus 3 could be sold off at magnificently low prices to the Middle East, there would be a true computer at the head of the Spectrum range, and everyone would be happy.

This would be affordable because you would probably pay a stupidly low price for MGT and would get all the stocks of Coupés that are left over.

I would like to move on to other matters. Can you tell me if Empire/Entertainments International/Lucasfilm is going to be producing a Coupé version of *Pipe-Mania*? If not, can you print the collective address of this mega-company, because I am in the process of writing such a program,.

Somebody pat Enigma Variations on the back for having the guts to release a game for the Coupé. Admittedly, *Defenders of the Earth* may not have the gameplay of something like *Pipe-Mania*, but I hope it sells well.

• *Are these men really related?*

What happens to all the old arcade machines when no-one uses them any more? There must be thousands of old arcade machines that no-one wants sitting in a warehouse somewhere (probably in Ealing). Why didn't the programmers at Gremlin put a 'Save Game' feature into *Super-Cars*? The game takes so long to complete I would say such a feature was a necessity.

On piracy, FAST has got it all wrong. The organization should have spent money trying to put the Medway boys (among others) behind bars. People are obviously not going to take any notice of adverts like those we've been plagued with for the last year or so when they see these idiots continually releasing disks containing five or six games at a time.

A friend of mine even stated that he thought FAST was wasting money that the software publishers should have spent bringing down prices. What surprised me was that he actually believed what he was saying. He doesn't own a single legitimate game.

I hope to read better Coupé news next week!

Geoff Winkless, Leicester

I'm surprised that someone so adept at kicking people while they're down and telling people how to do their job should be so good at writing long, but otherwise intelligent letters.

Perhaps if you'd seen it coming you wouldn't have bought a Coupé, but, then again, it's easy to be wise after the event. We, like you, hope for better news on the Coupé front, and we have passed on your invaluable advice to FAST.

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- ★ ***Size:*** 8" x 4" x 1" (200mm x 105mm x 29mm).
- ★ ***Weight:*** 495 grammes (with batteries).
- ★ ***Applications:*** calendar and diary, address and phone book, Lotus 1-2-3 compatible spreadsheet, text processor, communications software.

COMING SOON!

In addition to the excellent software built-in to the Portfolio Free of Charge (see right), other software and peripheral products, such as the sophisticated Pocket Finance package and serial/centronics interfaces are available. And it doesn't stop there. Many manufacturers have recognised the potential of the Portfolio and have already started to design new peripherals and software. Products currently under development include: Serial interface with built in mini modem, Apple Macintosh interface, business, utility and programming software plus a range of adventure and battle strategy games. For further free details on the Portfolio range, fill in the coupon below and return it to Silica Systems now.

5 BUILT-IN APPLICATIONS TO GET YOU ORGANISED!

To get you started, Portfolio comes with a suite of five useful functions built-in, all accessible from a simple menu display.

TIME MANAGER

More than just an electronic diary, the Portfolio Time Manager enables you to plan your appointments via a comprehensive calendar and diary. It can even be programmed to sound an audible alarm at specific times to remind you of important appointments.

CALCULATOR

Your Portfolio will be invaluable in the office or at home as a powerful pocket calculator. It has a full range of functions, including factorial, power and root calculations, all with multi display formats and memories.

ADDRESS BOOK & DIALLER

Portfolio has a complete address book facility that allows you to store hundreds of addresses and phone numbers. And, at the touch of a button, you can retrieve any one of them, or search for a specific grouping, such as "all Italian restaurants". And, when you are ready to book your table, hold your Portfolio to your telephone mouthpiece and use its special built-in tone dialler to dial the number for you.

TEXT PROCESSOR

The Portfolio's built-in text processor program includes word wrap, line and column count, string search, in fact most of the functions you would find in a word processor. It handles printer and word processor control codes and allows easy transfer of files between Portfolio and your desktop PC.

SPREADSHEET

For real calculating power, Portfolio has a Lotus 1-2-3 compatible spreadsheet built-in. It has 127 columns x 225 rows and reads/writes Lotus V1.0 and V2.01 files, so you can transfer data to and from Lotus 1-2-3 on your desktop PC. The Portfolio's 256K ROM includes MS-DOS and PC BIOS compatible systems software.

MEMORY CARDS

Portfolio can store and retrieve data and programs from its own RAM, or from small credit card size memory cards, that slot into its built-in card drive. The cards are available in three sizes, 32K, 64K and 128K, so you can carry a library of data in your pocket. The card drive also accepts ROM cards, which can contain commercial or custom software.

POWER SUPPLY

Portfolio is powered by three AA batteries which will run for up to six weeks with normal use, or from the mains using an adaptor. All the peripherals take their power from the Portfolio, so no extra batteries or adaptors are required. A 'battery-low' warning and memory back-up ensure that information is not lost when the batteries are changed.

INTERFACES & PERIPHERALS

Portfolio can communicate with other computers and supports a growing range of peripherals via a built-in 60 pin bus connector. Peripherals available include serial and parallel interfaces and memory expanders (to 640K). You can also add a card drive to your desktop PC, to enable it to read/write to Portfolio's cards.

SILICA SYSTEMS OFFER YOU

FREE OVERNIGHT COURIER DELIVERY: On all hardware orders shipped in the UK.
TECHNICAL SUPPORT HELPLINE: Team of Atari technical experts at your service.
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Before you decide when to buy your new Atari Portfolio, we suggest you think very carefully about WHERE you buy it. Consider what it will be like a few months after buying your Portfolio, when you may require additional peripherals or software, or help and advice with your new purchase. And, will the company you buy from contact you with details of new Portfolio products? At Silica Systems, we ensure that you will have nothing to worry about. Silica Systems is a new division of Silica Shop, the UK's leading Atari specialists. This new division has been established to provide a service to the more serious home user, as well as to business and education purchasers. Silica have been established for over 12 years, and have an annual turnover of £13 million. With our unrivalled experience and expertise, we can now claim to meet our customers requirements with an understanding which is second to none. But don't just take our word for it. Complete and return the coupon now, for our latest Free literature and begin to experience the "Silica Systems Service".

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Which computer(s), if any, do you own? .....

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COMPUTER CHAOS

A selection of tales from around the world that have computers as the progenitor of disaster: by Mel Croucher

LONDON, UK

A building society issues summons against mortgage repayment defaulters. The defaulters appeal to the Ombudsman, who finds the High Street money lenders grossly incompetent and throws out the cases. Chief witness is the automatic billing computer, which cannot cope with today's interest rates.

Pre-programmed to handle mortgage repayments up to £1,000.00, when any mortgage breaks the thousand-quid-a-month barrier, the machine simply knocks off the first digit from the bill, much to the delight of hard-pressed householders such as the couple whose repayments have fallen from £935.45 to just under £10.

(*Radio 4 'Money Box'*)

MASSACHUSETTS, USA

Lightning strikes the drawbridge between Vineyard Haven and Oak Bluffs, frying the 3-phase controller and knocking out the computer transformers.

The bridge is fully automatic, and in its 'down' position. Forty sailing boats and tall powerboats are imprisoned inside the lagoon for three days.

This debacle occurs just three weeks after a previous lightning strike had closed the bridge for 24 hours, forcing engineers to install what was called a "foolproof isolation system".

(*Martha's Vineyard Times*)

LONDON, UK

During question time in the House of Commons, it is revealed that the police based the decision to open an emergency gate at the Hillsborough Football Stadium on a computerised turnstile tally.

This record indicated that the ground had ample space to accommodate the crush of supporters trying to get in. Tragically, it was wrong.

(*Hansard*)

MOSCOW, USSR

With the spirit of *glasnost* in thick in the air, the Kremlin is shedding more and more light on past computer cock-ups, such as the famous Soviet Cruise Missile tracked over Norway and downed somewhere in the forests of Finland.

It seems that during New Year celebrations, the missile's guidance system took it into its head to alter its programmed flight-path and drop in on Hamburg.

(*Daily Express*)

NC STATE, USA

Local radio stations report that students in the Research Triangle Park complex have been receiving suspect bills.

The accounts are all in order, but the State computer has been addressing bills to the wrong students. What makes this newsworthy is the fact that the system error is only discovered after somewhere around 6,000 bills have been sent out.

(*Software Engineering Notes*)

PRAGUE, CZECHOSLAVAKIA

At a meeting of the Forum on Risks to the Public in Computer Databases, three delegates require first aid and one is hospitalized after a disagreement over the origin of the word 'bug'.

(*Elsa Szczolpianskya*)

SYDNEY, AUSTRALIA

Hungry visitors can now benefit from the computerised ordering and cash register system at the Sydney Opera House.

Due to technical problems, whatever is keyed in by the waiters is relayed to the kitchen as 'octopus'. A harassed waiter is quoted as saying "the diners settled for octopus anyway".

(*Sydney Morning Herald*)

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NEW! - AMIGA PACK

Commodore A500 Flight Of Fantasy

£399 INC VAT

A500 BATMAN PACK

The Commodore A500 Batman Pack must surely rank as one of the most popular computer packs ever! The pack features the **Commodore Amiga 500 computer** with **mouse controller** and **TV modulator**, plus four top software titles. The software includes: **'Batman The Movie'** - Rid Gotham City of the cunning joker, in Ocean's top selling title based on the blockbuster Batman film; **New Zealand Story** - high quality conversion of the leading arcade game; **Interceptor** - Dogfight with two F-16's in this leading flight simulator; **Deluxe Paint II** - top quality Amiga graphics package which set the standard for others to follow. Return the coupon for further details.

PACK INCLUDES:

A500 Computer & Mouse	£399.99
A520 TV Modulator	£24.99
Batman The Movie	£24.95
New Zealand Story	£24.95
Interceptor	£24.95
Deluxe Paint II	£49.95
TOTAL RRP:	£549.78
Less Pack Saving:	£150.78
PACK PRICE:	**£399.00**

£399 INC VAT

AMIGA 2000

For the more serious or professional applications user, Commodore have a selection of systems based around the expandable Amiga 2000, at prices from £1295+VAT. The A2000 features a full 1Mb RAM (expandable to 9Mb), 9 system expansion slots, plus IBM compatibility with the use of PC-XT or PC-AT bridgeboards. Complete and return the coupon, putting a tick in the A2000 box, for details of A2000 computer systems.

£1295 +VAT= £1489.25

FLIGHT OF FANTASY

Flight of Fantasy is the very latest Amiga 500 pack from Commodore, featuring BRAND NEW software releases, to make this the most spectacular A500 pack ever! The pack features the Amiga 500 computer with mouse controller and TV modulator, as well as four top software titles. These include the following:

DELUXE PAINT II:

The high quality graphics program that set the standard for other Amiga art packages. Deluxe Paint II includes powerful, easy to use tools that bring out the artist in you. Create masterpieces, presentations, 3D perspectives or just doodle.

ESCAPE / ROBOT MONSTERS:

Here's something completely different - a science fiction story with comic book style graphics. Our heroes Jake and Duke are on the Planet X rescuing Humans who have been captured by the Robot Monsters and forced to create an evil Robot Army to DESTROY EARTH! Jake and Duke fight their way through hordes of evil Robots to help the Humans escape.

RAINBOW ISLANDS:

Slip on your magic shoes, practise throwing a rainbow and you're ready to go island hopping. From the Island of Doh to Monster Island, you will encounter Doh himself, stinging insects, lethal combat machines, mechanical assailants, the formidable beings of legend and folklore. Finally enter the world of darkness and its inhabitants.

F29 RETALIATOR:

The ultimate in flight simulation with a choice of two aircraft and four battle environments with dozens of different tactical missions. Aerial combat, strategic bombings, interactive ground based battles, seagoing carriers ... the list of features is endless. Real time cockpit displays, including 'true radar' enhance the realistic feel of this stunning simulation.

PACK INCLUDES:

A500 Computer & Mouse	£399.99
A520 TV Modulator	£24.99
Deluxe Paint II	£49.95
Escape/Robot Monsters	£19.99
Rainbow Islands	£24.95
F29 Retaliator	£24.95
TOTAL RRP:	£544.82
Less Pack Saving:	£145.82
PACK PRICE:	**£399.00**

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BLISTERING PACE – PIXEL PERFECT PASSING – SUPERB TACTICAL GAME PLAY

KICK OFF 2 greatly enhances the game play of KICK OFF, winner of THE GAME OF THE YEAR award in U.K. and similar awards right across Europe. A host of new features have been added to the ones that enthralled the players the world over.

Full size multi directional scrolling pitch with the players, markings etc. in correct proportion.

1 to 4 players (Amiga & ST only) option.

2 players TEAM option against the computer or 2 other players.

Hundreds of players, each with a unique combination of attributes (Stamina-Pace etc.) and skills (Passing, Shooting and Tackling etc.)

Instinctive Kick Off joystick controls to dribble, pass, shoot, head or chip a ball and do sliding tackles or scissor kicks.

After Touch controls to bend or dip the ball.

Set Piece Free kicks including dummies to chip the ball or bend the ball round a defensive wall.

9 types of corner kicks with full control of shot power. Long and short Throw In.

Team selection from a squad of 16 with substitution and choice of tactics.

League and Cup competitions with extra time, injury time and sudden death penalty shoot out.

Facility to view, edit and save the action replays and create Golden Shots disc.

Kit design – 6 styles and 32 colours. (Amiga & ST only)

Facility to load Player Manager teams for a single game or league game.

Load your own designed Tactics from Player Manager.

Red & Yellow cards, 16 different referees, Injury time and host of features to create the atmosphere for a game which is a real fun to play.

Special Events provision to load Data Discs or Cassettes for events like World Cup, European Cup etc...

Restricted features on IBM and 8 bit machines.

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